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Bulletin

April 1947

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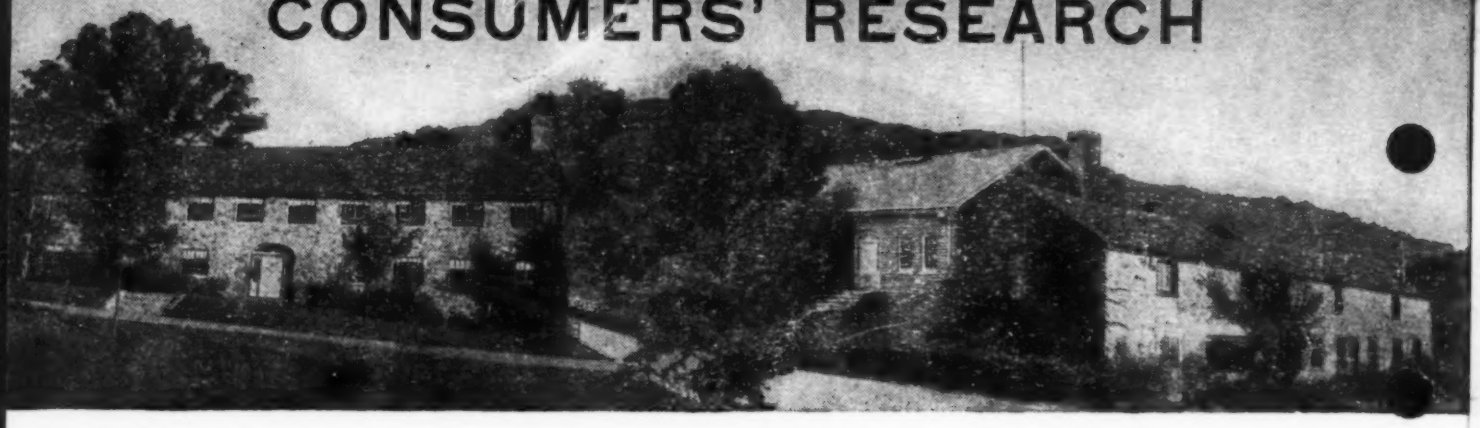
CONSUMERS' RESEARCH



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Off the Editor's Chest

THE consumer's resistance to present prices of a wide range of commodities is so vigorous that many retailers and others are beginning to sit up and take notice. It appears that many people, regardless of the size of their incomes, are making retrenchments. Considerable editorial attention has been given to interviews with individuals at different salary levels ranging from $2600 a year to $200,000 a year that appeared in The Wall Street Journal several months ago. All reported that they were making more money than before the war—and getting less for what they spent. Those in the lower income brackets reported that they were economizing by getting fewer haircuts, refraining from buying new men's shirts so far as possible, giving up photography as a hobby or their wives were giving up visits to the beauty shop altogether; lack of funds made it impossible for them to buy certain needed items such as a radio set, sewing machine, electric mixer, refrigerator, automobile, washing machine, dishes, and furniture. The amount of money required for food and the amount deducted for taxes were two items that figured conspicuously in the complaints about the high cost of living of those interviewed.

It would appear that the inability to buy certain appliances considered essential for efficient operation and comfort of the typical American home shown in these various interviews represents a rather widespread condition. Reports are beginning to come in that indicate the demand for new and used cars is not nearly so bottomless as it was once supposed to be. Dealers in cameras find that the few new and very high-priced models available are not being snapped up as eagerly as was expected. Sales of fur coats have been disappointing to stores and manufacturers, and some department store executives fear that they will be squeezed by the cost of many manufactured items on one hand and the consumer's resistance to high prices on the other.

There has been evidence that even so small and necessary an item as a haircut can price itself out of the market to some extent. One observing consumer, writing to a New York newspaper, pointed out that two of his friends made a practice of getting haircuts less frequently when their barbers raised their rates, so that in effect the customers paid no more than they did before. One of them, who pointed this out to his barber, discovered on his next visit that the price of a haircut had been reduced from 90 cents to 75 cents, and the barber admitted that he was making more money at the lower rate.

There are many who believe that the foundation of American prosperity is the mass production of goods and services for all who desire to purchase. The term "prosperity" as it is here used is one defined by the Webster dictionary as signifying an "advance or gain in anything good or desirable." It means, in large part, an abundance of consumers' goods; household appliances that make for speedy and efficient performance of the various tasks involved in daily living such as washing, ironing, cleaning, and cooking; plentiful supplies of good-quality foodstuffs, and clothing, or materials

(Continued on page 25)

Scientific and Technical Experts and Editors: F. J. Schlink, R. Joyce, M. C. Phillips, Helen P. Alleman, A. R. Greenleaf, and Charles L. Bernier. Editorial Assistants: Mary F. Roberts and B. Beam.

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¶CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.

★★★For a brief cumulative index of 1947 BULLETINS preceding this issue, see page 26.

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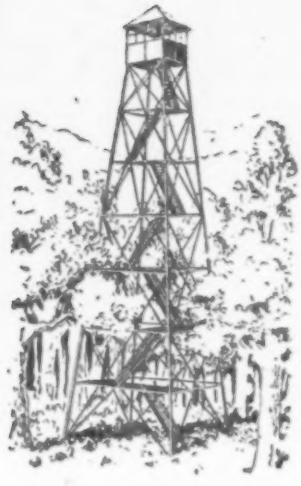


The Consumers' Observation Post

CARROTS have long been considered an excellent source of pro-vitamin A, which is converted into vitamin A by the digestive processes when the vegetable is eaten. In fact, raw carrot salad and raw carrot sticks have come to be looked upon as health foods and, on occasion, even listed as such on restaurant menus. Now comes the news from Holland that the carotene from cooked carrots is imperfectly transformed into vitamin A and that its absorption from the raw vegetable is practically zero. Those who never could tolerate raw vegetables anyway will be pleased to know that their dislike of carrot sticks has a sound nutritional basis.

* * *

STATION WAGONS are in such demand that the automobile manufacturers are puzzled. With the present backlog of orders, 1947 production is expected to be twice the volume of 1941. Fisher Body Division of General Motors will make station wagon bodies for the first time in its history. Studebaker is also planning to go into this type of production for the first time; Hudson, Crosley, and Packard are hoping to get back soon into the manufacture of station wagons. Prices range from something like $1495 for the Willys-Overland's "People's Car" model to $2594 (at the Flint factory) for Buick's "Estate Wagon," according to a report in The Wall Street Journal. Although all manufacturers report heavy orders for all types of automobiles, dealers are not so optimistic about future sales, according to another report. Prospective purchasers, when told that their new cars have come in, decide "to wait a while" and used car operators with inventories of high-priced secondhand models are reported to be hard hit by the present lack of customers.

* * *

SHIPPING PHONOGRAPH RECORDS BY MAIL is one of the biggest headaches for distributors of shellac records. One dealer in New York City alone reported that he usually found up to five records broken out of a package of twenty-five.

* * *

HIGHLY FLAMMABLE FABRICS will be banned for wearing apparel sold in interstate commerce if a bill introduced in Congress by Representative Canfield of New Jersey goes through. Another bill along the same lines introduced by Representative Johnson of California would permit shipment of highly flammable fabrics provided they were permanently flameproofed for the life of the textile. There is still a third measure sponsored by the National Retail Dry Goods Association which limits restrictions to wearing apparel made from flammable material and provides for the labeling of flammable fabrics with a warning against their use in clothing. The Bureau of Standards is reported to have altered the proposed commercial standard for flammability of textiles to limit it to textiles used as wearing apparel and to exclude decorative fabrics, draperies and curtains. This would appear to be a step backward. It is true that it was the tragic cases of youngsters who were severely, in some cases fatally, burned when their playsuits caught fire, that highlighted the need for legal protection against future recurrence of such tragic accidents. On the other hand, it is obvious, in the light of recent terrible hotel fires, that highly flammable fabrics used in draperies can also be a serious fire hazard and a standard that is carefully formulated with consumers' needs in mind clearly should not be limited simply to fabrics used in wearing apparel.

* * *

CANCER OF THE SKIN can be avoided or prevented in some cases if certain precautions are taken, advises Dr. Frank E. Adair of Cornell Medical College.

Workers in gas stations, for example, should take great pains to scrub tar, oil, and gasoline from the backs of their hands. Anyone who has a wart, mole, or a slow-healing sore should consult a physician to make certain that cancer does not develop. Those who are past middle age or who have an aging skin will be wise to avoid sunburn. Even doctors were warned by Dr. Adair to take great care in the application of X-rays and radium to the human skin, for such treatments involve considerable danger of radiation burns that may lead to the development of cancer.

* * *

SURFACE NOISE AND NEEDLE SCRATCH are two annoyances to music lovers which mar the reproduction of many a good recording played on a high-fidelity radio-phonograph. A device has now been invented to eliminate this difficulty in part. Called Dynamic Noise Suppressor, it was conceived by Herman H. Scott of Technology Instrument Corp., Waltham, Mass. It consists of an electronic circuit involving one or more tubes, built into the amplifier. It will reportedly be built into the new Fisher and Scott radio-phonographs. It must not yet be assumed, however, that the device will solve all record noise problems without disadvantage to the user, for there will be a loss of quality in the softer passages. Whether the gain in sound quality will be worth the very considerable extra cost cannot perhaps be determined until after a considerable period of trial, test, and experience.

* * *

GOOD NUTRITION was the subject of many a conference and much propaganda during the war years. The widely-publicized "Basic Seven" food pattern, however, which set up a group of foods from which the daily diet must be selected if it were to be considered well-balanced came in for some severe criticism last fall by Dr. Robert S. Harris of M.I.T. By using native foods, Dr. Harris found that it was possible to give Mexican children a well-balanced meal for 12 centavos whereas a lunch based on a selection from the "Basic Seven" pattern would have cost 55 centavos. Dr. Harris pointed out that we do the people of the world a disservice by implying that ours is the only good dietary and that our food pattern is essential to good nutrition, for this is surely not so.

* * *

BLUE WHITE DIAMONDS are extremely rare. The Federal Trade Commission has ruled that a "blue white" diamond is one which does not show a trace of any color other than blue or bluish, says a recent issue of the St. Louis Better Business Bulletin, which also notes that the American Gem Society has recommended that the term shall not be used at all in the advertising of Registered Jewelers. Other jewelry practices that the B.B.B. criticizes are: the use of illustrations that make a $49 diamond look like an $800 stone, and any use of the terms "waterproof" and "shockproof" to describe watches for which "water-resistant" and "shock-resistant" are more accurate descriptions. The Bureau points out that it is hardly necessary to remind high-class jewelers that watches that have been used, or "rebuilt," should be clearly tagged to indicate this fact.

* * *

PATIENTS RUNNING A HIGH TEMPERATURE should be given adequate food, according to studies, made by two physicians, of 78 patients acutely ill or suffering from protracted fever or injuries. The old proverb "Feed a cold and starve a fever" was found to be poor advice. Patients on a liquid or semi-liquid diet, low in calories, showed symptoms of malnutrition in frequent cases. On the other hand, those patients who were put on a heavy-feeding program made excellent progress.

* * *

FLUORIDE TABLETS OR BONE MEAL PREPARATIONS taken in an effort to prevent tooth decay are not considered by the American Dental Association to be particularly effective in accomplishing the desired results. Furthermore the A.D.A.'s Council on Dental Therapeutics pointed out that fluoride added to diets already high in fluorine or in areas where water supplies contained significant concentrations of fluorine might constitute a health hazard. Although the presence of calcium, phosphorus, fluorine, and vitamin D are important factors in the diet for assuring the development of the teeth, the Council held that there was no evidence to show that they were important after the tooth formation was completed.

(Continuation of this section is on page 29)

Kitchen Step-Stools

UNFORTUNATELY for homemakers, this item of kitchen equipment is often not marked with a brand name, and the purpose of this report was as much to provide some general observations which may be at least a partial guide in purchasing as to compare the relative merits of the few trade-branded samples which it was possible to purchase.

There are two types of these stools: Type 1 is primarily a stool equipped with steps (Figures I, III); Type 2, an undersized step-ladder which can be used as a stool, if so desired (Figure II). Stools of Type 1 with auxiliary steps which pivot on a single supporting rod and swing out of the way under the stool, are judged unsafe to use as stepladders because the steps are prone to tilt inward when weight is placed on the inside surface of the second step and a bad fall may result. There are, however, stools of Type 1 which are well designed and have strong step mechanisms that are deemed safe to use. In the *Cosco* stool, for instance (Figure III), the steps rest under the stool until needed, when they may be easily brought into position for use by lifting up and forward until they rest in front of the stool. Two metal supports hold them firmly and prevent tipping.

Figure I
Type 1 step-stool, of poor design.

Figure II
Type 2 ladder-stool.

Well-made stools of Type 2 are always safe to climb up on but there are others of this type that are of poor construction which are often unsafe and are certain not to be durable. Their chief fault is poor or skimped design, often manifested as absence of adequate bearing surfaces for the rivets with which the moving parts are commonly held together and on which they move in relation to each other.

Before attempting to climb up on any step-stool or ladder, the housewife should make certain that the surface upon which it rests is level, for climbing on even a slightly tilted ladder is asking for trouble. (Falls from ladders of all kinds account for 600 deaths annually in the U.S.)

If a step-stool is to have a reasonably long life it must be able to withstand frequent applications of heavy weights without loosening of its assembly or developing a permanent deformation. Quality of materials, type of assembly, design, and workmanship are all factors which must be considered when estimating the likelihood that a stool will give safe and reasonably long service. The stools reported on were examined and their quality in respect to various important factors judged. They were also subjected to an actual load of 300 lb. live weight. The way they behaved under this loading was given the greatest weight in the ratings; the stools listed were deemed satisfactory in this respect unless otherwise noted.

Figure III
Type 1 step-stool, of good design.

In all but one of the stools tested, the top functioned both as a step and a seat, which is a weakness as it would require

that the top step be wiped off after every use of the stool for reaching a high shelf. However, as one or two steps suffice for most kitchen climbing operations, this was judged rather unimportant.

Stools should be reasonably well finished and of suitable colors to be acceptable in the kitchen. Feet should have some sort of protection (either smooth metal or rubber covers) to prevent damage to the kitchen linoleum or other floor surface by action of sharp or ragged edges on the floor.

All of the stools examined were considered of suitable height for kitchen use.

A. Recommended

Durham (Durham Mfg. Co., Muncie, Ind.) $3.95. Type 2, ladder. Steel frame with wooden top and steps ¾ in. thick; grooved steps supported at ends with steel angle braces; rubber pads on all feet. Frame is assembled with rivets; raised dimples around certain of the rivet holes provide bearing surfaces for some moving parts when the stool is opened and closed. Steps screwed to braces and frame. Finish of average smoothness but was thin in spots; steel parts white enameled; steps painted red. Doubly supported steps and well-braced frame provide sturdy construction; rated excellent from a safety standpoint. Easily operated. Weight 9½ lb., about 5 lb. less than the *Cosco* and considered satisfactory from the portability standpoint. **1**

Cosco, Model 4-A (Hamilton Manufacturing Corp., 1935 Evans St., Two Rivers, Wis.) Steel, Type 1, $7.45 with back rest; $6.45 without back rest. Another model also available in chromium without back rest, at $9.45. Two retractable steps pivot on supporting bars so placed that steps cannot tip when in use. Legs rounded for strength but not tubular; step frame is tubular; metal floor rests or "gliders" on all six feet; steps were of steel with rubber treads cemented or glued on. Frame fastened together with bolts and nuts; horizontal steel bracing bands made assembly rigid; adequate bearing points provided on the bracing bands for the step pivot rods, but brace which supported steps should be of heavier gauge material and better located; steps screwed to step frame; whole construction judged to be unusually strong and rigid so that the stool would be rated excellent from a safety standpoint. Finish of average smoothness; back and legs white; steps and seat red. Easily operated. Rather heavy— 14¾ lb. —which would interfere to some extent with portability, especially in moving the stool up and down stairs. Edges of back rest were sharp, making handling somewhat uncomfortable, a disadvantage which would be avoided if backless model were purchased. Judged the best step-stool in the group examined. **2**

Steprite (Distributed by Benjamin and Medwin, 1150 Broadway, New York 1) $8.95. This is a combination of Types 1 and 2, but is more like Type 1. Retractible step operated by raising or lowering hinged top which according to tag on the stool is supposed to support "your back—when used as a kitchen stool." This seems a somewhat illogical arrangement since normally the back rest is needed when the assembly is to be used as a stool, but in this case when the back rest was in position for use, the stool of necessity had been converted into a stepladder. However, if the appliance was used as a stool without a back, it had the advantage that the top was kept clean for sitting upon; uncomfortable when used as stool with top up. Square tubing formed legs and frame braces; stool had steel angle braces for step and stool top and steel gliders on all six feet; steps, wooden, ⅝ in. thick, with rubber tread mats. The framework was welded, steps fastened to frame with steel screws; top cover mounted on top step with steel strap hinge. Construction satisfactorily strong so that stool would be rated excellent from a safety standpoint. Workmanship and assembly good. Finish smooth, without bare spots; framework finished in aluminum paint, wooden parts red. Easy to operate. Like *Cosco*, somewhat too heavy to carry conveniently—14 lb. **3**

B. Intermediate

Maid of Honor, Aluminum Step-stool (Sears-Roebuck's Cat. No. 11—07001) $4.66, plus postage; $4.95 in retail stores. Not listed in Sears' Spring and Summer 1947 catalog. Type 2, ladder. Aluminum frame with grooved wooden steps supported at both ends by aluminum channel pieces and angle rests. Frame well braced with twisted flat aluminum pieces crossed in pairs. Legs had rubber bumpers, but it might be expected that sharp ends of metal would cut through fairly soon, shortening useful life of appliance. Steps nailed firmly to frame. Stool was rated excellent from a safety standpoint, although this condition might not be of long duration because frame was assembled with rivets, and no bearing reinforcement was provided. Finish smooth, with no bare spots; frame, natural aluminum; steps red. Easily operated. Lightest stool in group tested—6 lb.—easily moved about. **1**

Stoolmaster, Aluminim Step-stool (Distributed by Kamkap, Inc., 200 Fifth Ave., New York 10) $6.95. Seems to be same product as Sears' *Maid of Honor* Aluminum. **2**

C. Not Recommended

Maid of Honor (Sears-Roebuck's Cat. No. 11-07012) $4.88, plus postage; $4.49 in retail stores. Type 1 stool, with back; steps pivoted on single wooden supporting rod to form ladder. All wood construction; workmanship somewhat crude. Plywood steps grooved by rough saw cuts unevenly spaced. Dowel rods glued into legs and legs glued into seat; back rest fastened to top step (seat) and legs by screws; steps screwed to step frame. Bottoms of legs unfinished, and so might damage linoleum or other good floor surface. Finish judged not heavy enough to withstand much washing; frame enameled white, steps and back rest red. Stool was rated poor from a safety standpoint; glued joints opened and legs became insecure under 300 lb. weight; steps were strong for this type of stool, but dowel rod supporting them was judged too light; step assembly was prone to tip inward if too much weight was applied on inside edge of second step and a bad fall might result. Stool was sufficiently light—9¼ lb.—for portability, but steps pivoted so easily into the ladder postition that the stool was awkard to carry about. **1**

Enterprise (Enterprise Housewares Company, Detroit) $3.98 (sold previously at $4.79). Type 2, lad-

der. Frame and steps of steel; frame channels well formed, with rounded corners and trimmed edges; metal steps of "box" construction with no braces; ribbing on treads considered not sufficiently deep to be of practical value; feet provided with rubber bumpers. Entire assembly made with rivets; no bearing reinforcement provided. Rubber foot pads were riveted to the metal legs and were of a design that could not be replaced by the layman without much inconvenience. Finish thin and unsatisfactory in appearance and had chipped away from metal in several places; frame painted with aluminum paint; steps and top red. Stool was rated poor from a safety standpoint; frame and braces became distorted and bent under 300 lb. load; steps bent and moved during application of weight causing legs to move with resultant distortion of stool top and strain on rivets. Easily operated and light enough—10 lb.—for portable use. 1

Willys 6-Cylinder Cars for 1947

WHILE the 1947 *Willys* 6-cylinder cars are not expected to be in production until mid year, some preliminary information concerning their design, as well as photographs of "mock-ups" have been made available. Financing operations by the company now being carried on may have an effect in determining the time when actual production will start.

1947 Willys

The car is rather attractive in exterior appearance. The frontal design may be described as a combination of the *Mercedes* V-radiator form with that of the "coffin" shape of the front-drive *Cord*. The form is also comparable with several of the racing cars which have appeared at the 500 Mile Indianapolis Race in past years. The grille bars are horizontal, formed into a V, while the hood is rather flat on sides and top, but increases in width along the vertical sides so that it blends well with the body.

Among several unusual features, the car has independent suspension for all four wheels. The front wheel suspension system is similar to that used on the *Studebaker* cars for 1947, but the rear wheels are mounted in a manner that has not been in use in this country. The transmission and differential are mounted on the frame; drive shafts project from the sides of the transmission to the wheels. Only one universal joint is used in each shaft, so that the wheels must be (and are) rigidly attached to radius arms which are pivoted on the frame alongside the universal joints. Due to this design, the rear wheels move about the pivots, thus swinging in vertical arcs, with the wheel camber decreasing with movement of the body downward. (Camber is the angle between the planes of the two wheels and the vertical; the bottoms of the two wheels on opposite sides of a pair are closer together than their tops, when camber is present.) With normal loads the wheels of the *Willys 6* are vertical, while with light loads the lack of parallelism, or camber, is quite noticeable.

The rear springs are of conventional leaf type, attached at their centers by rigid saddles to the radius arms carrying the wheels. Thus the springs, when they deflect, must twist slightly as the arms swing about the pivots located near the differential. Spring deflection and this swinging action of the arms cause the tread (distance from center to center of tires measured across the car) of the rear wheels to increase as the arms swing upward and decrease when they swing downward. However, it is probable that with most driving con-

ditions the small change in wheel tread can readily be taken up by deflection (sidewise) of the tires, so that there will be only a minor amount of actual sliding between the tires and road surface. In most independent suspension systems the wheels may move in arcs of slight curvature, but the tread contact points remain approximately the same distance apart, a condition which does not apply in this car.

Any disadvantages which may accrue from the variable tread may be offset by an advantage resulting directly from this design. In turning a corner, when the body tends to sway, the wheels will lean inwards at their tops, providing what some might consider as a sort of "bracing" action against skidding. Whether or not the fact that the rear wheels lean (as does a bicycle when turning), will actually help prevent skidding is perhaps not known. (It is possible, that, since the tire treads are not squarely making contact with the road surface, but will strike it at an angle, there may be, in theory at least, a precisely reverse effect.) Until information based upon actual tests is available, these points must remain academic; the question is, however, one of potential importance, and authoritative investigations of it should precede wide promotion of the car.

It is understood that the *Willys 6* engine develops 70 horsepower at 4000 revolutions per minute and has a rating, for tax purposes, of 21.6 horsepower. Piston displacement is said to be 148.5 cubic inches. (This may be compared with the 4-cylinder Jeep engine, 60 h.p. at 4000 rpm., 134.2 cu. in. displacement, and taxable rating of 15.6 h.p.) A speed of from 75 to 80 miles per hour is claimed for the new *Willys*. Fuel consumption is given as up to 35 miles per gallon. We also understand that the engines are to be machined and assembled by the Hupp Corporation, a so-called "contract work" company making engines and parts for other manufacturers. (So far as is known the Hupp Company is not producing automobiles now, and does not expect to.)

The wheelbase of the *Willys 6* is said to be 104 inches, making the car definitely smaller than present "Big 3" makes. The weight of the *Willys* is expected to be in the neighborhood of 2500 pounds.

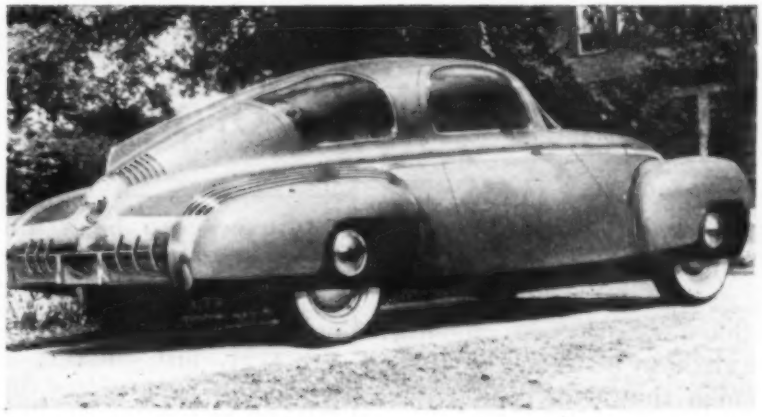
Tucker Torpedo

So much publicity has appeared recently concerning this new car that some information concerning it may be timely. There have been negotiations to float a stock issue of $2,000,000 to underwrite production costs. Actual production of cars is doubtless a long way off, but some cars may be available for dealers in the first half of 1947 if prospective difficulties over availability of plant facilities are ironed out.

Externally the *Tucker Torpedo*, as its name might imply, is quite radical in design. Nevertheless it possesses a number of noteworthy features, which when modified by production and other requirements, may prove advantageous. The upper section is almost entirely of transparent material, probably plastic. (Glass would certainly be preferable for at least the windshield, due to its superior resistance to wear and scratching.) Below the belt line the "torpedo" or "bullet" form predominates, especially at the forward end, where the hood comes to a virtual point. While the rear fenders are faired into the sides of the body, the front fenders are separate units and turn with the front wheels. (Turning of the fenders with the wheels is not considered desirable, especially if the fenders have large flat vertical surfaces, as may be used to prevent splashing onto the body. Such areas reduce frontal stability by presenting increased areas—above those existing previously—toward the wind when the wheels are turned, and are also a handicap in cross winds.) There are three headlamps, two of which turn with the front wheels. One lamp is mounted rigidly in the center of the hood. (The use of three lamps may present legal difficulties in a number of states.)

The engine of the *Torpedo* is mounted in the rear and the rear wheels are the driving wheels. The rear end location of the engine has long been advocated by many automotive engineers. The engine is to be

a 6-cylinder opposed ("pancake") type, i.e., three cylinders in each bank, similarly to many small air-cooled aircraft engines (*Continental, Lycoming*, etc.). But the engine will be liquid cooled, with the cooling system completely closed and sealed. Presumably ethylene glycol (typified by *Prestone* and other anti-freezes of the so-called permanent type) will be used. Closed and sealed systems of this type were developed in the late 1920's, but were never used to any extent, even on airplane engines. Fuel injection is to be used, eliminating the usual carburetor. Injection systems are now available for airplane engines and function similarly to the injection units on Diesel engines, although for a gasoline engine the fuel is usually injected into the intake manifold close to the intake valve of each cylinder, rather than directly into the cylinders as in the Diesel. A 24-volt electrical system is specified. The reason for this change is not known, although systems of higher voltage than the conventional 6 volts can offer a number of advantages.



Tucker Torpedo

Additional features are said to include a two-stage torque converter in the transmission, 4-wheel independent suspension, an instrument panel supported by the steering column, and unit body and frame construction.

Electric Fans

IN our September 1946 BULLETIN we gave a preliminary report on six electric desk fans, and indicated an *A-Recommended* rating for the *Diehl Junior* and *Hunter;* a *B-Intermediate* rating for the *Emerson Junior* and *General Electric;* and a *C-Not-Recommended* rating for the *Polar Cub* and *R & M Banner*. Tests included measurements of power taken by the fan when running, and the amount of air delivered in cubic feet per minute. The ability of the insulation to resist a proof-voltage test of 900 volts was determined and a measurement of the leakage current for each fan with the fans operating and not operating, immediately after each fan had been exposed to a humid atmosphere (90% relative humidity, 90°F) for 24 hours, and again after operating for one hour.

The complete report on the fans came to hand some time after the preliminary report and rather too late from a seasonal standpoint to include in one of the 1946 BULLETINS. Electric fans are soon to be a question of practical importance again; this brief report is made to show that the final test data confirmed the preliminary findings. For convenience of readers, the ratings of the September 1946 BULLETIN are repeated (in greatly condensed form). All of the fans offered a choice of oscillating or non-oscillating operation.

A. Recommended

Diehl Junior, Cat. No. B10AJ17 (Diehl Mfg. Co., Elec. Div. of Singer Mfg. Co., Finderne, N.J.) $13.55. 10-inch four-blade impeller. Highest in efficiency in the group. **2**

Hunter, Cat. No. 75, Type D10 (Hunter Fan and Ventilating Co,, Inc., Memphis, Tenn.) $15.40. 10-inch four-blade impeller. Also very high in efficiency. **3**

B. Intermediate

Emerson Junior, No. 2650-B (The Emerson Electric Mfg. Co., St. Louis) $12.55. 10-inch four-blade impeller. Efficiency below average. **2**

General Electric, No. FM9V1 (General Electric Co., Schenectady, N.Y.) $18.28. 9-inch three-blade impeller. Efficiency about average. **3**

C. Not Recommended

Polar Cub, No. A325 (A. C. Gilbert Co., New Haven, Conn.) $7.51. 10-inch four-blade impeller. Much the lowest efficiency in group—only 45% as good as the best fans. **1**

R & M Banner, No. B10A6-O (Robbins & Myers, Inc., Springfield, Ohio) $13.33. 10-inch four-blade impeller. Efficiency below average. **2**

Methods Suggested for Preventing Formation of Clinkers

Clinkers can be a difficulty in management of a coal fire in the home heating system, whether stove or furnace, at any time of the year, but clinkers are particularly a problem during the period of light heating load in the spring and fall. The brief article which follows will help the householder to manage his home heating plant more successfully during all seasons of the year. The information in it should be particularly useful in the relatively mild cool weather which lies ahead.

DESPITE the widespread tendency to attribute troublesome clinker to the quality of the coal used, engineers within the anthracite industry are virtually unanimous in their opinion that poor coal is one of the least common of several possible causes.

Faulty firing methods rank well above all other reasons for clinker complaints, and an almost infallible sign that firing methods are to blame is the occurence of clinker formation in mild weather. Many coals will clinker slightly and some even severely during periods of prolonged operation at high rates; but if clinker is troublesome in mild weather it is almost always due to one or more of the following firing faults.

1. *Insufficient air, inadequate draft, or unequal air distribution.* Shutting the ashpit draft door tightly in mild weather, opening the fire door wide to check the fire, or even banking the fire, will tend to cause clinker formation. The reason is that such practices do not permit sufficient air to pass *through the fire bed* to remove the heat as it is generated by the combustion of the coal. The correct method to use for checking the fire is to open the check damper in the smoke pipe (the damper that opens to admit the air of the cellar into the air stream flowing through the pipe). If it is impossible to hold the fire down to a banked condition with the check damper wide open, this is a sure sign that the damper is either of an inadequate size or that it is incorrectly located. In such cases the local heating contractor should be consulted.

To maintain the fire in a banked condition, when it is necessary to hold the rate of combustion down to a minimum, the ashpit damper must be almost completely closed. Care should be taken, however, to see that the ashpit is never completely sealed against admission of air to pass through the fire bed. (Many clinker complaints, particularly in systems automatically controlled by a thermostat, have been solved by the simple expedient of placing a piece of metal, say ⅛ inch thick, in position behind the ashpit damper so that it will remain open a little even when in the closed position.)

The turn-damper in the smoke pipe should be used only as a seasonal control. It can normally be opened wide in very cold weather and should be nearly closed on very mild days.

2. *Air bound cellars.* In many cellars, particularly those of houses built in a row, where the cellar window openings are limited in number and area, the fire is often starved for air. In addition to causing clinker formation, this reduces the draft, even on cold days when it is most needed.

The solution to air-bound cellars is to open a window slightly, so as to provide for a flow of air into the cellar. Care should be taken *not to provide more than the needed amount* of cold air; otherwise the cellar and the floor above will be cold, and fuel consumption will increase. Another method is to cut a small opening in the upstairs cellar door, to permit air from the first floor to flow to the cellar. The opening, which should be near the bottom of the door, should be screened to prevent the entrance of rodents to the rooms upstairs, and should be provided with a cover, so that it can be closed off, when necessary (e.g., when there is dust, smoke, or coal gas in the cellar that should be kept from entering the rest of the house). With some types of automatic firing, e.g., oil burners, the opening in the door may have a disadvantage in that if a "puff back" should occur, the oily, sooty deposits may find their way in greater quantities than otherwise into the living quarters of the house.

3. *Burning garbage refuse or papers on top of the fire* produces a thin shell of clinker on the fire, which in turn shuts off the air flow and rapidly leads to a full-scale clinker formation.

4. *Sudden or rapid changes in the burning rate.* This condition is normal in heating systems automatically controlled by thermostats. It can be corrected by arranging to have the ashpit damper always slightly ajar, as was described in numbered paragraph 1, so that air flow through the fire bed is never completely stopped, even when the thermostat calls for "no heat."

5. *Excessively thin fuel beds.* The normal correct fuel bed depth, if chestnut or stove coal is used, is usually level with the bottom of the firing door.

In determining the depth of fuel bed required, it should be borne in mind that the thinner the fuel bed, the faster the coal will burn. This is because the rate of burning depends on the ease with which air can pass through the fuel bed, and *not* on the amount of coal in the furnace. Air travels more readily through thin beds and thus burns the coal faster.

REGULATE THE FUEL BED ACCORDING TO THE WEATHER: thin beds in very severe weather, when it is necessary to get the most out of the fire, graduating to thick beds in very mild weather or when complete banking is desired.

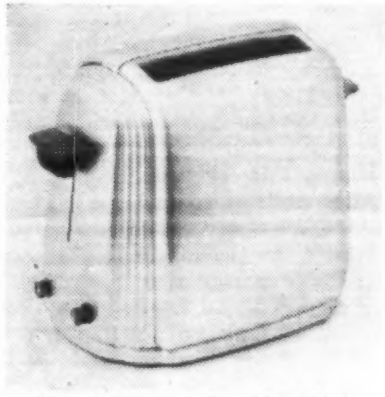
6. *Disturbance or agitation of the fuel bed.*

If the householder will keep these six causes of clinkering in mind, he will rarely have difficulty in keeping the problem under control.

Automatic Toasters

Some Post-War Models Not so Good, Electrically

IN this brief article CR is presenting its findings on a group of seven toasters of the automatic type. As shortages of such toasters have been stringent, only a few makes and models have been obtainable. Sometimes several big-city sources of supply had to be tried before a single sample could be located. When tests were finally gotten under way after much delay in procurement of specimens, the uncertainties and inequalities of post-war production became painfully evident. The *Knapp-Monarch* and *Universal* toasters were the only two of the original samples of six brands which were in such condition that tests on them could be completed. Original samples of the *Proctor*, Model 1472, and the *Toastmaster*, Model 1B12, failed the proof-voltage test and were replaced with a *Proctor*, Model 1466, and another *Toastmaster*, Model 1B12, in order that tests could be completed. The controls on the *Manning Bowman* toaster were defective



Knapp-Monarch, No. 22A-500-A

and it was returned to the place of purchase for replacement; however, as the dealer's stock was exhausted, a replacement sample was not forthcoming and no further tests could be made on this brand. The *Camfield* toaster failed the proof-voltage test and was replaced by another sample after some delay.

We enumerate these difficulties, not to trouble readers with our problems (which many others are experiencing as well, in connection with recent purchases of appliances), but to give some idea of the difficulties which arise in presenting test results with reasonable promptness under present conditions. We of course run into snags in trying to purchase almost every sort of consumers' goods at this time, and the day when a group of representative samples can be purchased for test without difficulty and without much delay and extra expense due to inadequate or defective stocks, still seems to be far in the future.

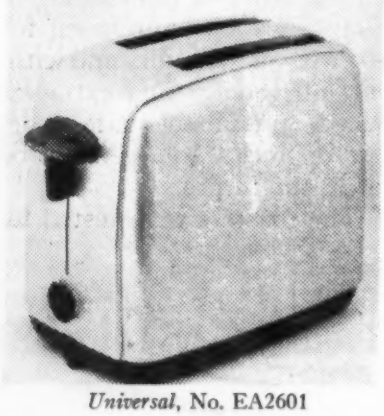
The toasters were tested for

Proctor, Model 1466

electrical leakage, withstanding application of 1000-volt proof voltage, power input, temperature rise during operation, and effectiveness in actual use. Each toaster was also given a critical engineering ex-

Toastmaster, Model 1B12

amination to determine the features which would appear to affect convenience of use and durability. All of the toasters had permanently attached cords (required no connection plug). In no case did exposure



Universal, No. EA2601

of the appliance to high humidity conditions cause corrosion. The toast could be removed manually from all the toasters before automatic toasting was complete. The seven toasters listed were well constructed and easy to clean. Figures in parentheses following the rated wattage indicate actual measured wattage input.

B. Intermediate

Knapp-Monarch, Model 22A-500-A (Knapp-Monarch Co., St. Louis) $14.95. Current leakage within accepted limits. Satisfactorily withstood proof-voltage test. Rated watts, 890 (920). Maximum temperatures of all parts which might be touched, after a half-hour period of actual toasting operations, were satisfactory, being well below accepted limits. Toasting was satisfactorily uniform. When using the No. 1 setting, the toast was barely browned on either side even when slices of bread were immediately inserted in rapid succession. There was some evidence of burning at the highest setting after 5 successive sets of slices had been toasted. At a medium setting, successive pieces of toast showed increasing degrees of brownness. **2**

Proctor Automatic Pop-Up, Model 1466 (Proctor Electric Co., Philadelphia 40) $18.95. Current leakage within accepted limits. Satisfactorily withstood proof-voltage test. Rated watts, 1100 (1140). Temperature of all parts which might be touched, well below recognized safe limits (130°F for metal, 160°F for nonmetallic parts) after a half-hour period of actual toasting operation. Toasting found uneven at three settings, Light, Medium, and Dark, with slight charring and some smoking at the Dark setting. **3**

Toastmaster, Model 1B12 (McGraw Electric Co., Elgin, Ill.) $18.75. The first sample purchased showed leakage current above limit after exposure to humidity. It failed the proof-voltage test and became open-circuited, making further tests impossible. A replacement sample of the same model was satisfactory as to leakage current. It failed the proof-voltage test at 900 volts after 45 seconds but did not become open-circuited, and satisfactorily withstood the 900 volts when given a retest. Tests were therefore completed on this sample. Rated watts not shown on name plate (1260). Temperatures of all parts which might be touched were well below recognized safe limits. Toasting was uneven on Light, Medium, and Dark settings; there was some charring

Proctor, Model 1472

and smoke in all 5 toasting operations performed at the "Dark" setting. **3**

Universal, No. EA2601 (Landers, Frary & Clark, New Britain, Conn.) $18.60. Leakage current was found above recognized limits after exposure for 24 hours to an atmosphere of 85% relative humidity at 85°F (with switch open); otherwise would have warranted an *A* rating. Satisfactorily withstood proof-voltage test. Rated watts, 1150 (1125). Temperature of fixed handle at end of toaster was above reasonable limit after 24 minutes of actual use in toasting. Toasting uneven at two settings, Light and Dark; fairly satisfactory at Medium. **3**

C. Not Recommended

Camfield (Camfield Mfg. Co., Grand Haven, Mich.) $17.95. Current leakage somewhat above accepted limits after exposure to humidity (with switch closed). Failed on proof-voltage test. Rated wattage not shown on name plate. Temperatures of all parts which might be touched were well below recognized safe limits. Damage resulting from failure in proof-voltage test pre-

Camfield

vented tests of performance in toasting. Tests on the second sample were not complete at time of going to press; will have to be reported in a later Bulletin. **3**

Manning Bowman, Model 115 (Manning, Bowman & Co., Meriden, Conn.) $17.95. Current leakage within accepted limits. Satisfactorily withstood proof-voltage test as received. No tests could be made at operating temperature, owing to a mechanical defect in the controls. As a replacement could not be obtained for further testing, this toaster is tentatively rated *C*. Rated watts, 790. **3**

Proctor, Model 1472 (Proctor Electric Co.) $17.95. Failed proof-voltage test and became "open-circuited," hence no further tests on this sample were possible. Rated watts, 1100. The manufacture of this model was discontinued in December 1946. **3**

"Moduflow" Controls for Automatic Heating Systems

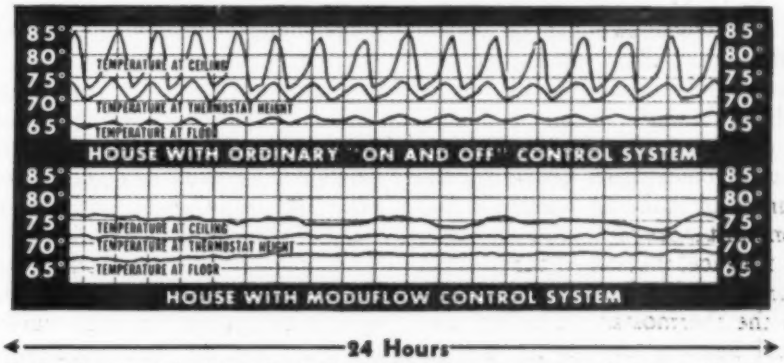
WITH the current widespread acceptance of automatic heating, the design and selection of proper *controls* for oil, gas, or coal burners is a problem of such importance that it is safe to say that it is commonly responsible for the difference between satisfactory and unsatisfactory results from a heating system. No automatic system can be better than its controls.

One of the outstanding postwar developments in the domestic control field is the new *Moduflow* line of Minneapolis-Honeywell Regulator Co., Minneapolis 8. While advertised under one name, *Moduflow*, there are in reality several types of controls involved, e.g., as designed for automatic oil, gas, or coal burners and as operating in conjunction with forced warm air, forced hot water, and two-pipe steam systems. At present these controls are not available for one-pipe steam, gravity warm air, or hand-fired coal or coke furnaces.

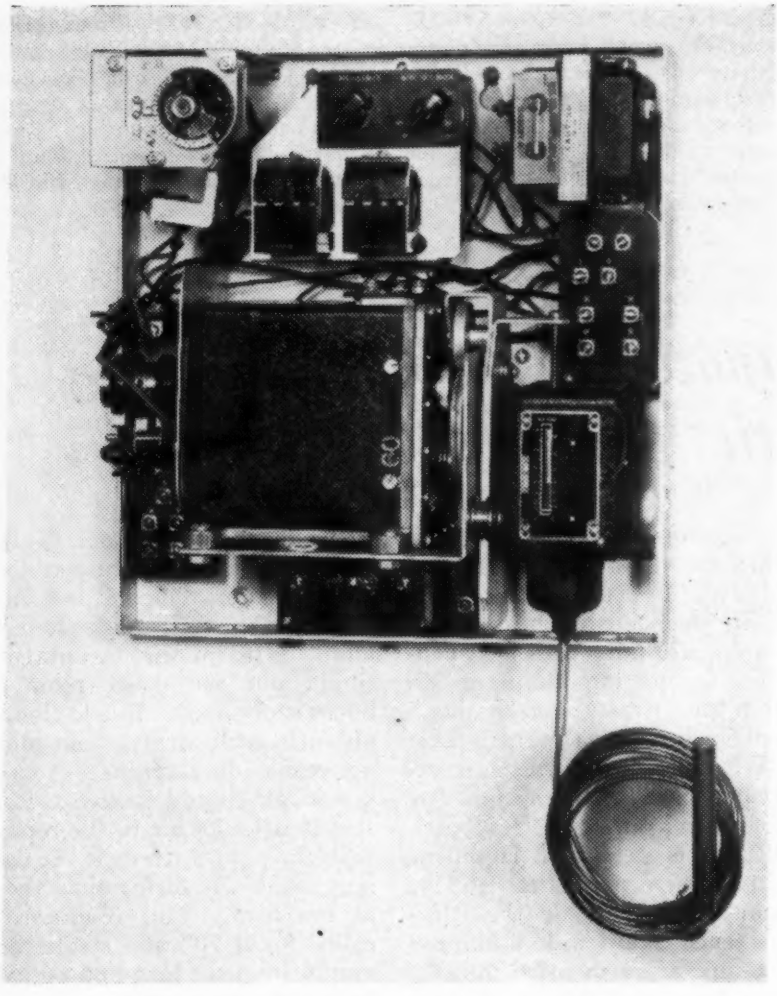
The several versions of the *Moduflow* have the common objective of substituting a "modulated" (regulated or varied in accordance with the amount of heat required) form of continuous heating for the admittedly less satisfactory on-and-off control method, characteristic of virtually all other types of control systems.

Conventional on-and-off controls send heat to the various rooms in "surges"; several disadvantages result from this method. When the thermostat is satisfied at, say, 70°F, the burner shuts off, but the boiler and heating system are still hot; thus heat continues to flow into the room, an effect known as "overshooting." Conversely, when the thermostat calls for heat, the burner is started, but because the system has cooled down during the "off" period, there is a resultant lag in the actual delivery of heat to the rooms. Not only do these factors tend toward wide variations in temperature in some installations but—and this is of even greater importance—the repeated changes in the rate of heat flow to the registers or radiators tend to set up local currents of air circulation adjacent to the radiators. This produces uneven heating.

With a *Moduflow* system, the heat flow is proportioned at all times to the heat losses of the house. (Losses vary with outdoor conditions of temperature, sun, wind, etc.). With this system, a more uniform air circulation throughout the entire room or house is obtained. In addition to objectionable drafts, the most noticeable disadvantage of conventional control systems is a stratification of air in the rooms, with the temperatures at the ceilings materially higher than those at the floor. This condition is called "cold 70" and results primarily from the long "off-period" before the thermostat again calls for heat, which allows the radiators to cool down to a point that permits a layer of cold air, at a temperature well below that of the body, to be produced by contact of the air in the room with cold radiators, windows, walls, floors, etc. When this occurs, the body



In the above reproductions of actual recording-thermometer records in two identical houses, one of which was equipped with Moduflow, *and the other not, the close temperature control and relatively even distribution of heat with the* Moduflow *system is readily apparent.*



Moduflow *Reset Panel. Note the "remote bulb" in bottom left-hand corner which is placed in a radiator (or warm-air duct) to act as a "sensing device." By this means, radiators, for example, are controlled to within a few degrees of a predetermined temperature rather than being permitted to cool off as much as they normally would in burner off-periods.*

begins to radiate heat to the cooler surfaces near by; this gives one the feeling of being cold, even though the *air* of the room may be at the normal temperature of 68° or 70°F.

The *Moduflow* systems, while differing in their mechanical arrangements, are all designed to substitute modulation (as defined in column 1 on page 13) for on-and-off control, by operating the burner to maintain an ample and constant store of heat in the boiler or furnace, instead of turning the burner on or off in direct response to the thermostat. The real and final heating control is then effected by admitting heat to the rooms in general response to the thermostat but as modulated by secondary controls *set to sense the amount of heat needed at a given time*. In these systems the room thermostat is really used as a heat-loss metering device instead of a direct control as it would be in the conventional method of heating-plant control.

In practice this is accomplished in several ways, according to the type of heating system and the *Moduflow* method selected. For example, on a gas-fired forced-warm-air system and with the "volume control method," the first call for heat in the fall would open a damper in the main warm-air duct slightly, and simultaneously turn the gas burner on to a "low" position. As the burner heats the furnace the forced-air fan or blower would be started and the slightly opened air dampers would permit a small portion of the available air volume to circulate to the rooms. Further demands for heat would be met by the modulated opening of the air damper with the burner still operating intermittently in a "low" position. When the temperature outdoors went low enough for the air dampers to reach a point approximately 75% open, the burner setting would automatically be switched to "high" with a corresponding repositioning of the air dampers to compensate for the higher air temperature in the ducts. The descending cycle would be the reverse with the burners dropping to a "low" position whenever the air damper closed to the 25% open position. In this manner a modulated or regulated flow of heat is obtained by drawing upon a constantly maintained reservoir of heat of a magnitude correctly proportioned to the heating demand.

Another *Moduflow* application is known as the "reset method." This can be installed at any time, even during the heating season, and requires little or no modification of either new or existing heating systems. The reset method differs from the conventional system in that, instead of operating the air-circulating fan of a forced-warm-air system or the circulator of a forced-hot-water system directly, the room thermostat determines the radiator temperature which will be needed to balance the heating requirements of the room, and sets the controls to maintain this temperature in the radiator constantly. This, in turn, is accomplished by means of a remote control bulb attached to a radiator or placed in a warm-air duct and connected to the control box by capillary tubing. The bulb acts as a sensing device controlling the operation of the circulating pump or air fan so that just the right amount of heat is provided to maintain the desired radiator temperature. The complete cycle is somewhat as follows:

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On the first call for heat, the burner is turned on to maintain boiler or furnace temperature at the "low" aquastat (or airstat) setting. The circulating pump (or fan) operates intermittently to maintain any temperature at the radiators (or registers) for which the thermostat may be calling, this being accomplished through the remote or sensing bulb. As the need for heat increases, the thermostat, operating through a motor in the control panel resets the controller to maintain higher radiator or convector temperatures, which are in turn met by the increased operation of the circulating pump or fan. This continues until at about 75% of continuous circulator operation the controls switch the burner to the "high" aquastat (or airstat) setting and the system resets itself to compensate for the higher water (or air) temperatures. Conversely, a decreasing heat demand reverses the process until with the circulator operating only 25% of the time the burner is again switched to the "low" position.

There is also a modulating valve method for two-pipe steam systems which is similar to the volume method as has been described for warm air, except that it employs a modulating steam valve in place of the special modulating air dampers.

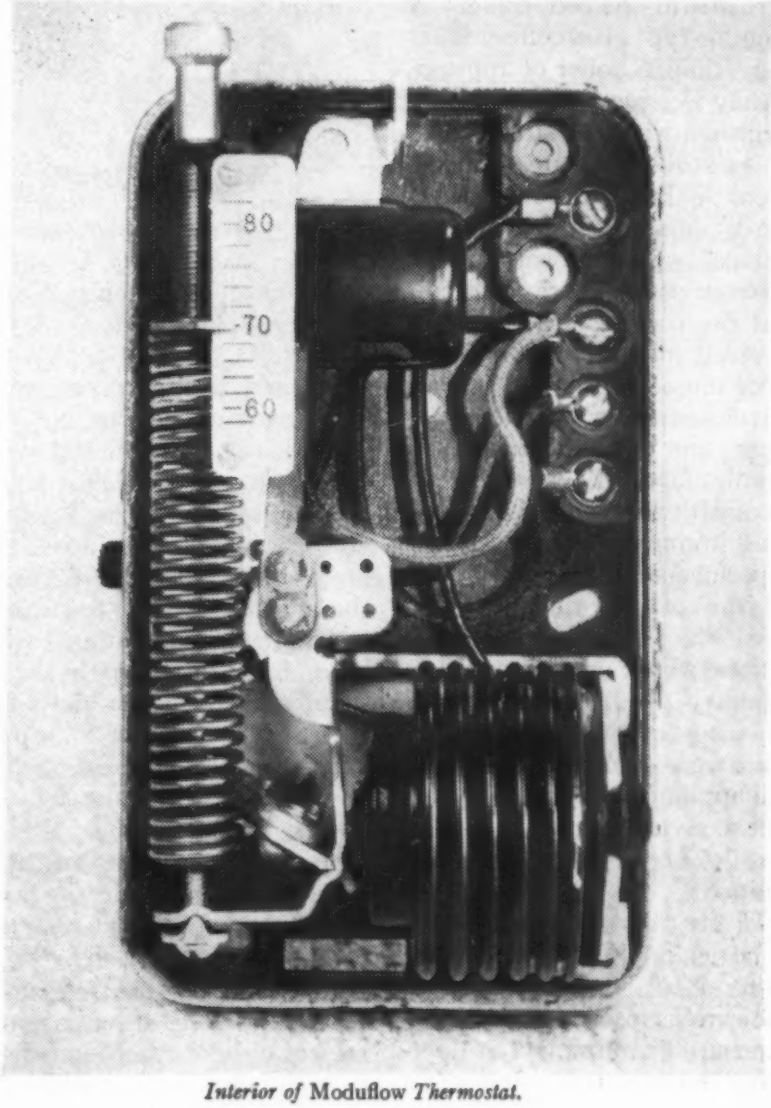
The basic principle of all of the *Moduflow* systems is to maintain a constant level or store of heat in the boiler or furnace at either a low or a high point, *as general weather conditions require at the time*, and then to draw upon this heat through appropriate modulating valves or dampers or through the intermittent operation of circulators in direct proportion to the heating demand of the house at the time.

This constant reservoir of heat in the furnace does not imply continuous operation of the burner, since it responds as usual, on a yes-or-no, on-or-off basis, to controls so as to maintain either a "low" or a "high" temperature in the furnace, cutting on and off when these conditions have been met, just as with conventional controls. With the modulation system of control, a definite saving in fuel may be expected; this is produced by prevention of temperature overshooting and an elimination of sudden (and hence, wasteful) demands for heat.

All *Moduflow* systems are available with day-night controls to provide lower night temperatures as desired.

A further desirable feature of these systems is their adaptability to "zone" control where, particularly in large residences, separate temperatures may be maintained in different parts of the house. For example, a three-zone control could regulate separately temperatures in the living, sleeping, and utility quarters. This is accomplished by duplicating the individual room controls, such as the thermostat and modulating dampers, for each of the several zones to be controlled. Admittedly expensive, it is nevertheless the ultimate in selective control of domestic heating systems.

The installed cost of all of the *Moduflow* systems is considerably higher than consumers have been accustomed to pay for conventional heating-plant controls. Prices start at $250 and advance with the system selected and with the installation and labor costs in the locality involved. However,



Interior of Moduflow *Thermostat.*

it should be borne in mind that, in the *Moduflow* system, the householder gets a complete system of inter-related controls and such other necessary regulating devices as dampers and valves, so that he is buying a good deal more than he gets in buying a room thermostat and damper motor, and he can expect closer and more uniform control of living temperatures, with a corresponding greater degree of comfort, than would be obtained with any of the conventional (and lower-priced) temperature control systems.

An Electric Stove-Toaster and a Broiler

Vogue Kitchenette

THE *Vogue Kitchenette* is a combination toaster and table stove, having one single-heat unit and one three-heat unit separated by a non-automatic push-up type two-slice toaster, all assembled on a chromium-plated base. A vacuum-type glass coffee maker and a double boiler of approximately 1½ quart capacity were furnished with the stove.

Vogue Kitchenette; a combination table stove and toaster.

The stove was tested for electrical leakage under various conditions; 1000-volt proof (breakdown) test was applied between the electrical circuit and the frame of the stove as received and at maximum operating temperature with the circuit closed and energized; power input, and the temperatures of handles and all exposed surfaces with which the user might come in contact were measured; a performance test was made on the toaster during which toast was prepared under conditions which might prevail in ordinary use; the speed and efficiency of the stove heating units were checked; features of the appliance which might affect convenience of use, and details of construction were examined.

Electrical leakage was found to be negligible in the appliance as received, but was high with the switch closed after 24 hours' exposure to humidity, at operating temperature, and after 48 hours at room temperature and humidity (70° to 85°F, 50 to 70%).

The stove, as received, with the circuit closed but not energized, withstood the 1000-volt proof-voltage test. At 600 volts, at maximum operating temperature, failure took place; the break down occurred between the lead-in wires and the frame.

The device is equipped with four single-pole, single-throw switches with metal handles. These were rated at 5 amp.—125 volts, but a check of the power input to the heater elements indicated that the 5-ampere switches that were used were inadequate for the load imposed upon them, except that of the "low-heat" element of the three-heat table stove unit.

Handles of the stove base and toaster did not reach excessively high temperatures while the stove was in operation, but temperatures of all four of the metal switch handles greatly exceeded the recognized limit of 130°F. Later models of the appliance are pictured as having plastic handles.

Practical use tests of the toaster were made under conditions standardized during previous tests of toasters. Toasting was found to be uneven, whether the toaster was operated from a cold or from a hot start.

The stove heating units were of the coiled wire type and were approximately 4½ inches in diameter; the one on the left was a single-heat unit while the one on the right had three heats. The two units were tested for speed of heating and efficiency in accordance with nationally recognized specifications for this type of test, and were found

only fairly efficient. This was to be expected inasmuch as open coil units are not the most efficient type and are not judged suitable for an appliance which is much or regularly used.

There were several points to criticize in the construction of this appliance: The switches were marked "On," "On," "Low," "High," in that order, but there was no indication as to which heating unit each controlled. This is an unfortunate weakness of many electrical heating appliances, including ranges; their manufacturers apparently assume that the user can play around with the various switches and heating elements herself for a time to find out what controls what and to what temperatures. Inadequate inspection and supervision were indicated by the fact that several of the terminal screws of the unit were not tight, and half of the lock washers provided with some of the screws were so placed as to be ineffective in preventing loosening of the screws.

During the course of the test, high temperatures caused discoloration of the lacquered surfaces around the bases of the toaster and stove units. The chromium-plated casing of the base warped, also presumably due to the high temperatures during parts of the tests. The feet around the ends of the base, which were made of plastic, became chipped. By the end of the test, the lever for lifting toast out of the toaster-well had become disconnected from the lifting mechanism, making the toaster unusable. The construction of this part was such that a permanent repair job appeared impossible; thus the toaster gave a very short life, indeed, and if the sample tested for CR was typical of regular output of this brand, the manufacturer must have had a great number of complaints about performance.

The heating elements of the toaster were so insecurely mounted that the current-carrying parts could make contact with the frame. In the first sample tested this occurred early in the testing procedure, making replacement necessary. (All further tests were performed on the replacement sample.) The design of the appliance provided no way to clean the space easily below the heating elements of the two cooking units. The space in which the switches were mounted was not ventilated, but the spaces directly below the stove units were.

The compactness of this appliance has its advantages and disadvantages. The combination of toaster and cooking units makes it possible to perform several limited cooking operations in a very small space, a matter naturally of interest to people who live in very small apartments or furnished rooms. On the other hand, the fact that the stove elements are very close to the toaster means that it would require care to make toast without being burned by the steam from water boiling on the adjacent burner. The burner size was such that a cooking vessel larger than 4½ inches in diameter could not be efficiently used.

The only real advantage of this type of appliance over a separate toaster and either a two-unit stove or two one-unit stoves with larger units is the fact that it can be plugged into a single wall outlet (provided the wiring is adequate for a 2300 watt maximum load; that is, uses No. 12 wire or larger). This in effect makes 3 cooking units available from one outlet; this is a real advantage where wall sockets are few and far between, as they are in many small apartments. As an appliance for convenient and regular use, however, it falls considerably short of deserving a recommendation to consumers.

C. Not Recommended

Vogue Kitchenette (Sheridan Electronics Corp., 2850 S. Michigan Ave., Chicago 16) $29.75. Combination two-unit electric table stove and toaster (non-automatic type). Total wattage, 2060. High electrical leakage after 24 hours' exposure to humidity. Failed proof-voltage test at maximum operating temperature. Switches inadequate for single-heat stove unit, toaster, and high heat of two-heat stove unit; adequate only for low heat of two-heat unit; metal handles became much too hot during use. Toasting uneven. Toaster push-up handle pulled loose from mechanism, making toaster useless after very slight use. Stove heating units, of coiled wire type, were only fairly efficient; the stove units were too close to the toaster so that the user who was making toast would at times be burned by steam from a cooking vessel on one of the stove units.

Test of Holliwood Broiler—Later Model

SHORTLY after publication of the report on table broilers in the September 1946 BULLETIN, a new model of the *Holliwood* broiler appeared on the market. Several rather important changes made in this appliance seemed to justify a retest.

Most important from a safety standpoint is the addition of another complete circuit in the heating unit so that only one set of terminal pins is "live" at any time. In the new model, there is a partial guard for the upper pins, probably sufficient

to prevent accidental contact while the user is attaching the appliance plug; there should be a similar guard for the lower pair of pins. The unused set of pins is not "live" during normal operating conditions, hence accidental contact with these would not be dangerous. However, because of the spacing and arrangement of the terminal pins, it is possible for a person accidently to insert the plug incorrectly, that is with the contacts in a vertical instead of a horizontal plane. If this should be done, one of the exposed pins is "hot" (at full 110 volts) and hence quite dangerous; the broiler, however, will not heat with the plug so connected.

The high-setting wattage has been reduced from a nominal value of 1450 (actual, as measured, 1405) to 1100 (actual, 1032). This has had the dual effect of eliminating the spattering observed during use tests of the first model and of keeping the temperatures of the handles well within recognized limits.

This broiler was given the same series of tests as the *Model 7B* reported in the September 1946 BULLETIN. It was found safe electrically in the breakdown and leakage tests. A different kind of cord set was used (which did not carry the Underwriters' Laboratories' seal on the plug as the first one did); this was of about the same quality as most of those furnished with the broilers reported on previously.

The temperature of the table top beneath the broiler was too high, as was true of all the broilers in the previous tests, but not so high as to scorch the table top.

C. Not Recommended

Holliwood, Model 44T (Finders Mfg. Co.) $19.95. Wattage, 1100 (1032 and 728). Heating unit, oval in shape, approximately 12 x 6½ in., supported on metal plate by ceramic insulators. Terminals were only partially guarded, and their arrangement was such that by error in attaching plug, exposed terminals could be left "live" and dangerous. (During normal operation, exposed terminals were not live, and hence contact with them was not likely to be dangerous.) The fault is one that can be easily and cheaply corrected by the manufacturer. About average in speed of heating; temperature at cooking level after 15 minutes, 605°F. This, like the model previously tested, was found comparatively slow in cooking pork chops.

Durex—A New Razor Blade of Good Quality

SINCE CR's report on razor blades in the December 1946 BULLETIN, tests have been conducted on a new blade, the *Durex*—a double-edged razor blade of the kind that fits *Gillette*-type razors—which has been heavily advertised, at least in the East. The blade is offered for sale at 10c for 5 blades, 25c for 15 blades, plus postage, from the Durex Blade Co., 207 West 25 St., New York 1. Tests on samples of this blade indicated that they were of quite exceptional quality, at least as good as were the *Dublekeen* blades recommended by Consumers' Research some years ago. The performance of the *Durex* blade was excellent both in the actual shaving tests and on CR's razor-blade testing instrument.

Readers must remember that as with all razor blades, there is no certainty that the product will continue to be good. While our findings are based on several samplings, it is quite possible that, as with other blades which have been found very good, the quality may deteriorate in the near future, or ultimately. It would be interesting if the distributors or manufacturers would get the idea that it might be worth their while to maintain the quality of their blades fully up to the original standard. (We shall check from time to time to see if the performance of this brand does continue at its present high level.)

Portable Electric Room-Heaters

PORTABLE electric heaters are not a substitute for the regular heating system, but are normally used as an auxiliary device to augment the regular heat supply in small rooms, bedrooms, bathrooms, etc., or in sickrooms where additional warmth is often required. *While all electric heaters are 100% efficient in the conversion of electric energy into heat*—an important point to remember in considering advertising claims for electric heaters of all sorts—they differ considerably in the extent to which they can effectively direct the heat which they generate. Cost of operation is very high at a rate of 1½ cents to 2 cents per kwhr., and even that rate would ordinarily be reached only in homes having a large appliance load; at such a moderate charge for electricity it would still cost four to five times as much to obtain the same amount of heat from electric heaters as from a coal-burning furnace.

Note that graphs for all of the heaters are drawn to the same scale as is shown in Figures 1 and 2, to permit comparisons to be made by the reader, directly.

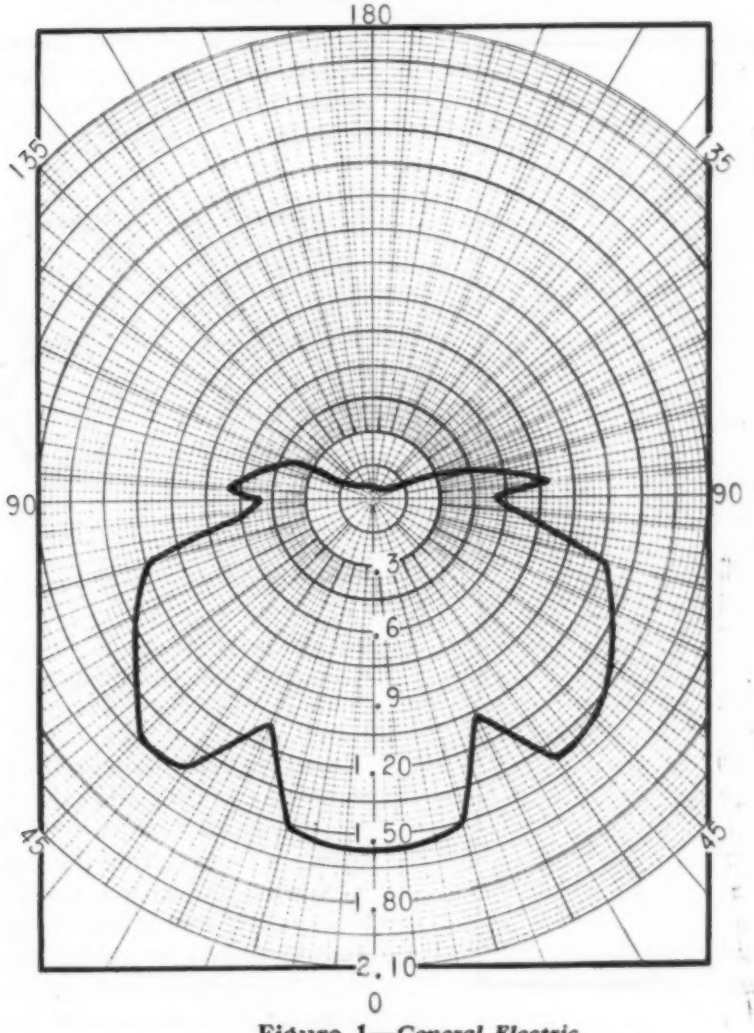


Figure 1—*General Electric*

Distribution of radiant energy in watts per sq. ft. at 10 ft. distance at different angles measured from the major axis of the heater. Measurements were taken in a horizontal plane at mid-height of the heater. (Figures at top, bottom, and sides represent the angular position [in degrees] relative to major axis. Figures in vertical line are watts per sq. ft.)

The most common type of portable electric heater is the radiant bowl type. The bowl is about 12 inches in diameter and 3 to 4 inches deep. The heater element usually consists of a heater wire wound on a ceramic tube or cone. This unit is either equipped with a threaded base, similar to that of an electric lamp bulb, to be screwed into a socket in the center of the reflector, or is mounted with its horizontal axis 2 or 3 inches out from the reflector with the front edge of the tube on a plane parallel to that of the reflector rim. A more modern version of this type of heater is built in the form of a small cabinet having two vertical heating elements with a plain or rippled reflector set behind them. All of these heaters, of course, are covered with a wire grille to prevent combustible material, such as clothing, from coming into contact with the red-hot wires and to safeguard anyone from being burned. The hot elements of the above types operate at fairly high temperatures of the order of 2000 degrees Fahrenheit, or more.

A third, and the most modern type, is entirely different from the two types already discussed. It consists of a strip-heater element mounted between two vertical glass plates about 21 inches wide and 18 inches high supported in a metal frame which is carried on a low pyramidal base. The ap-

pliance is provided with a carrying handle. Heat is radiated from both sides, the surface temperature being very low (about 320°F), compared with the common types of electric heaters. Claims made for the heater, which is sold under the name *Infralectric*, include "You see no flames. . .you see no glow. . .you smell no fumes . . .it heats objects by means of invisible, radiant rays. . .uses about one-third less electricity than most conventional heaters." The claim that it heats objects by means of invisible, radiant rays, is misleading, for the implication is that all of the heat produced is transmitted in this manner, when actually the amount so radiated was only 1/3 of the total. The claim that the heater uses about 1/3 less electricity than the conventional heater is approximately true, but not necessarily an advantage. It signifies simply that the heater uses only 1000 watts rather than the 1320 watts which other brands use. To repeat, all electric room-heaters are 100% "efficient." Thus the total heat transmitted to the room by the *Infralectric* will be about 1/3 less than most conventional heaters.

Editor's Note:

This is the second of two articles on Electric Room-Heaters. The first article, which appeared in the January 1947 BULLETIN discussed in some detail the methods (conduction, convection, and radiation, by which heat is transferred, and gave some information concerning costs and hazards of operation. Information on electric-water or electric-steam radiators was also included.

CR's Tests

CR's tests of five electric heaters included power input, measurement of surface temperatures at positions likely to be handled or touched during operation, measurement of radiant energy, fire hazard, and tests for electrical safety.

Radiation Measurements were made of the radiated watts of each heater at a distance of 10 ft. The radiation intensity is expressed in watts per square foot at 10 feet distance and was measured for each heater in a horizontal and vertical plane at various angular positions with respect to the normal axis of the heater. The results of these tests are shown in the accompanying charts. It is

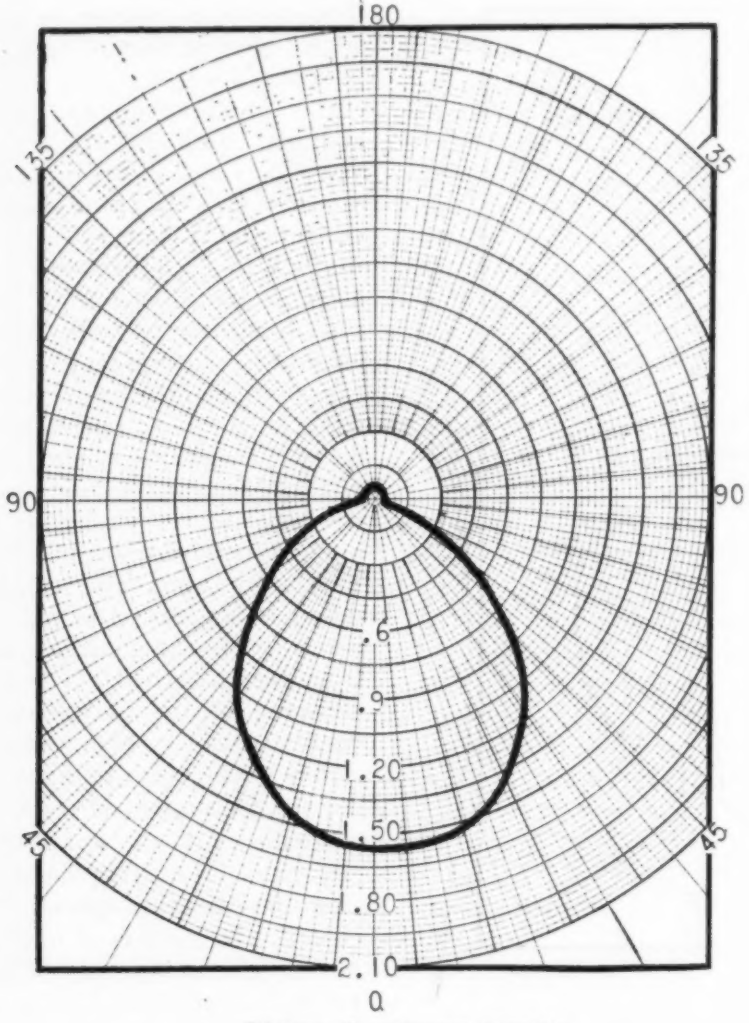


Figure 2—*General Electric*

Same type of data as Figure 1 except that measurements were made, in a vertical plane containing the major axis, giving nature of heat distribution at various angles upward and downward from the center of the heater.

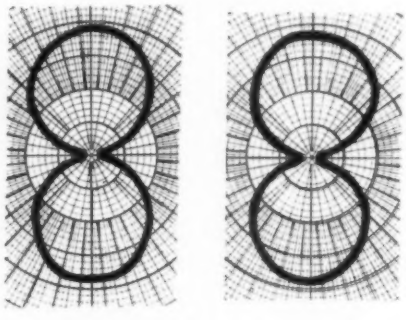


Figure 3—*Infralectric*

Horizontal Plane *Vertical Plane*

interesting to note that the *General Electric* heater does a better job of distributing the heat than the heater made by the Jamaica Machine Company, which radiates less heat to the sides. The curious shape of the distribution curve for the *General Electric* results from the obstruction by the central strut (see illustration) as it gets in the way of first one heater element and then the other. Also at the 90° positions, one heater element tends to block off the other. The *Infralectric* heater gave good distribution but had a maximum value of only 0.57 watts per square foot (at 10 ft. distance) or about 1/3 that provided by the *General Electric* at the same distance.

The two bowl heaters, which were typical of heaters of this type, sent out high intensity beams of radiant energy that were about six times as intense as that from the *General Electric* but were confined to a narrow angle (about 10°). Because of the high temperature of the radiator body and the effectiveness of the bowl reflectors, such heaters radiate about half of the energy supplied; the remainder is carried off by convection currents from the heater element and to a lesser degree by currents of air from the heated bowl.

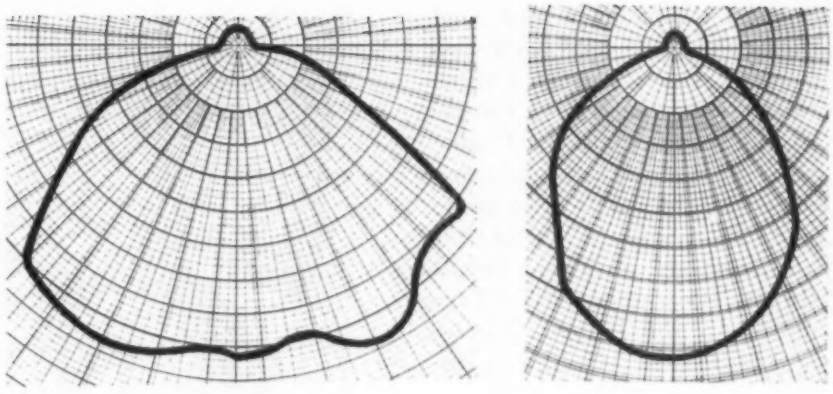


Figure 5—Jamaica Machine Company

Horizontal Plane *Vertical Plane*

Electrical Safety. Tests were made for electrical leakage between the metal housings of the heaters and the electrical circuit under normal room conditions, after subjection for 24 hours to conditions of 85°F temperature and 85% relative humidity, and at stable operating temperature. Proof-voltage tests were also made at 1000 volts on each heater as received, and under stable operating conditions. All of the heaters passed both tests and are not considered to present any shock hazard in use from electrical leakage.

Fire Hazard Test. This followed a procedure suggested by Underwriters' Laboratories, in which a double layer of cheesecloth was laid over the heater as close to the heater element as the guard would permit and with the heater standing in its normal operating position. The heater was allowed to operate in this manner for a half hour or more, and the condition of the cheesecloth noted. Additional tests were carried out—one with the heater on its back covered with cheesecloth, and another with the heater face down, with cheesecloth between the heater and the floor.

All five units met the Underwriters' test when covered with cheesecloth in the vertical position, and also when laid face down on the floor, covered with cheesecloth. However, there is no question but that in the face down position, the pieces of cheesecloth with the *General Electric* and the Jamaica Machine Company's heaters were pretty close to the com-

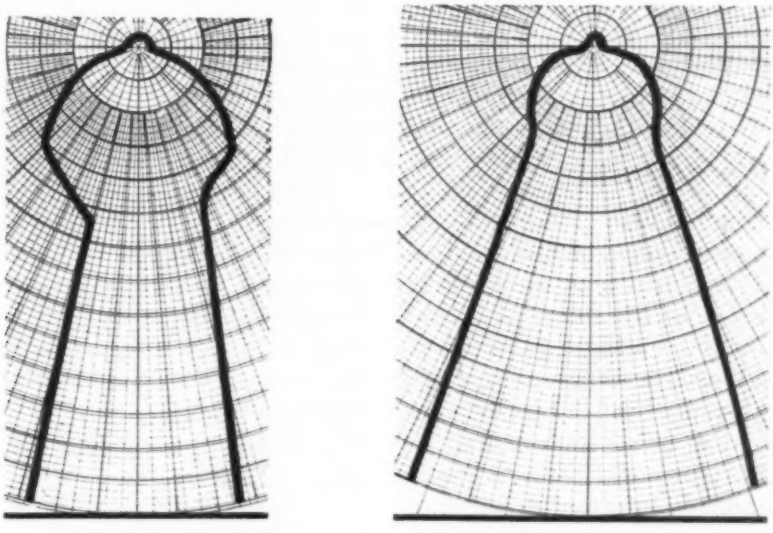


Figure 4—*Majestic*, No. 7

Horizontal Plane *Vertical Plane*

bustion point. The test with the heater laid on its back, face up, and covered with cheesecloth, while not one of the positions specified by the Underwriters' Laboratories, is one which might occur in a home, and the evidence is that it is a dangerous position, for although the cheesecloth did not ignite on the *General Electric* and Jamaica Machine Company's heater in this test, the temperatures reached were in the neighborhood of 500°F, and it would have required only a little fanning to cause the cheesecloth to burst into flame. The temperature strain in this position was too much for *Infralectric* heater and the glass on the up-face shattered over the entire area (as is customary with the heat-treated glass when subject to excessive thermal stresses). In the tests with the heaters laid on their back, face up, the cheesecloth on the *Majestic*, No. 7, was badly scorched, but did not glow or ignite, although the temperature reached as high as 695°F. In the same position, the *Majestic*, No. 75, caused the cheesecloth to ignite within 4½ seconds; hence both of these heaters would be definitely dangerous under the condition mentioned.

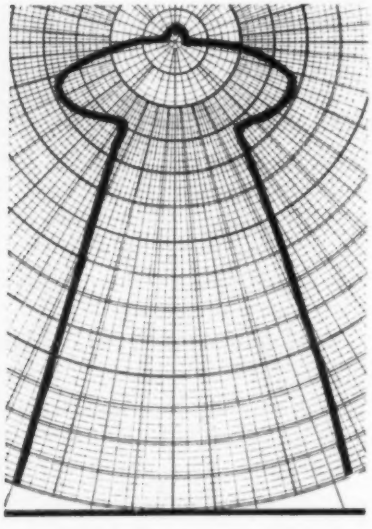
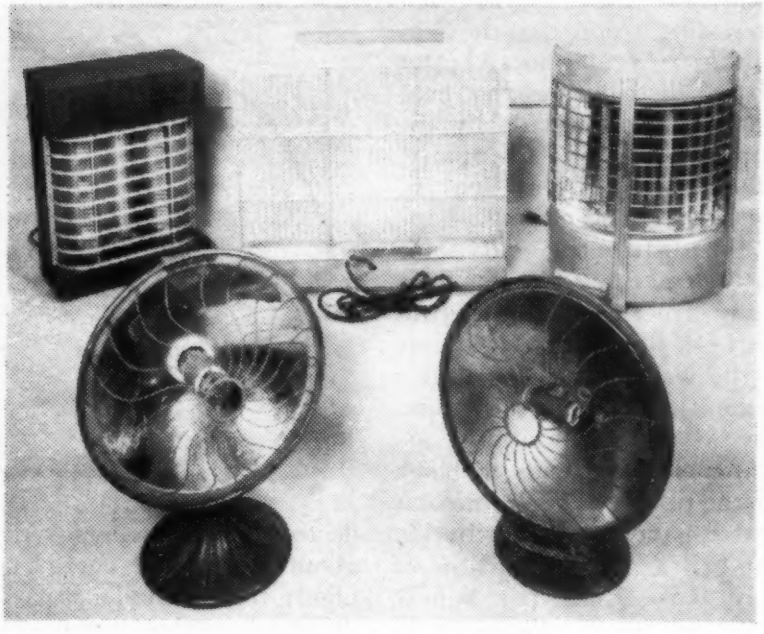


Figure 6—*Majestic*, No. 75
Horizontal and Vertical Planes



Five Electric Room-Heaters
Back Row: Jamaica Machine Co., *Infralectric*, *General Electric*.
Front row: *Majestic*, No. 75; *Majestic*, No. 7.

Surface Temperatures. These were measured by means of thermocouples at several different positions, positions selected with consideration of those parts which were likely to be handled or touched during operation. All of the heaters greatly exceeded in at least one position what is considered a safe temperature to touch, namely 130°F (for metal).

CR's Ratings

The following ratings do not take into account the fire hazard which exists should the heaters be accidently knocked over by a child, or by a household pet, or other unexpected occurrence, and subscribers are urged in using such heaters to take pains that the heater is located so that such an accident is not likely to occur. When used in a bathroom, which should be only when absolutely necessary, an electric heater of any type should never be placed so that it could by any possibility be accidently knocked over and fall into the tub, for if it should do so it is very likely to give a fatal shock to the person in the tub, possibly also to anyone attempting to rescue him. Of course the standing warning should again be sounded: Never set *any electrical device* so that it can be reached, touched, or handled by a person sitting or standing in a bathtub, or washing or working at a washbowl or sink.

The *Majestic* heaters discussed were purchased some years ago, and consequently these particular models may not be on general sale today. They were included in the test because it was considered that their performance would well typify that of the radiant bowl type of heater.

A. Recommended

General Electric, Cat. No. PH1A1 (General Electric Co.) $13.15. Sim-

ilar heater sold at same price in Montgomery Ward retail stores under the name *G. E. Arizona*. Rated watts, 1320 at 115 volts (1392 at 118 volts). Actual watts, 1378 at 118 volts. Heat delivered by radiation, the equivalent of 643 watts, or 47% of total heat output. Max. central heat intensity 1.6 watts/sq. ft. at 10 ft.

B. Intermediate

Jamaica Machine Co., 899 Boylston St., Boston. Carried no maker's name plate. $14, approximately. Rated watts, 1320 at 115 volts (1392 at 118 volts). Actual watts, 1292 at 118 volts. Total watts radiated, 463, or 36%. Max. intensity, 1.5 watts/sq. ft.

Majestic, No. 7 (Majestic Electric Development Co.) Rated watts, 615 at 110 volts (708 at 118 volts). Actual watts, 726 at 118 volts. Total watts radiated, 396, or 54%. Similar heater, *Bersted Focalite*, Cat. No. 706A, sold by Walgreen stores at $6.55. Max. intensity, 10.2 watts/sq. ft.

Majestic, No. 75 (Majestic Electric Development Co.) Rated watts, 1000 at 110 volts (1151 at 118 volts). Actual watts, 1122 at 118 volts. Total watts radiated, 521, or 46%. Similar heater sold by Walgreen stores as Cat. No. 709A at $7.49. Max. intensity, 8.0 watts/sq. ft.

C. Not Recommended

Infralectric (Radiant Heater Corp., 521 Fifth Ave., New York 17) $29.95. Rated watts 1000, actual watts 1042 (close enough to rated value). Total watts radiated, 344, or 33%. Rated *C* chiefly because of misleading claims (see text). If correctly represented in advertising, would warrant a *B3* rating (considered greatly overpriced, heat output and other major factors considered). Max. intensity, 0.6 watts/sq. ft.

Speaker, Amplifiers, Pickups

THE present widespread and growing interest in good reproduction of phonograph records has led CR to formulate a program which will assist consumers in obtaining better music in the home at a reasonable cost. Today's tendency in the radio and phonograph field is to offer the critical listener "super-deluxe" radio-phonograph combinations at prices running into a thousand dollars and up. The manufacturers' costs are very high—much high-than the average consumer will possibly imagine—but there is also the theory in the "luxury trades" that since production will be limited anyway by post-war economic troubles and shortages, sales emphasis might as well be placed on expensive equipment, which naturally pays manufacturers and dealers the biggest profits. Since very high-priced sets apparently are finding ready sale among consumers who have waited years to buy a good radio-phonograph, there appears to be little likelihood of a change for the better—from the consumers' standpoint—in the immediate future.

In this situation, CR plans to assist the consumer who cannot or will not spend a large sum of money for his record-playing and radio equipment, and will test those components which may be added to existing equipment to better its performance or may constitute parts of a complete home-assembled unit. The several parts needed and their functions are as follows: (1) A "record player," which usually consists of an electric phonograph motor and a phonograph pickup, mounted in a suitable covered case. The motor, with its turntable, provides the needed steady rotary motion of the record, while the pickup, as its name implies, holds the needle and "picks up" the recorded selection, and then transfers it, by means of wires, to the remainder of the equipment. (2) An amplifier, either a separate unit, or a part of a complete radio receiver, which provides the electronic means for electrically amplifying the recorded selections and for converting them into sound via (3) a loudspeaker (which may be a separate unit, or a part of a complete radio receiver). If (2) and (3) are in separate units, a radio tuner (4) may be added to form, in effect, a radio-phonograph combination. A tuner consists of a radio receiver, minus the usual audio amplifier and speaker. (Before the war several FM tuners or "converters" were on the market. It is not known that any FM tuners or converters are obtainable at this time except one, which is sold as a combination FM-AM tuner.) The electrical connection of the units making up the equipment can be handled by a local radio repairman, in case some member of the family is not something of a "radio bug."

With this general solution of the consumer's problem in mind, CR reported in the November 1946 and the January 1947 BULLETINS, results of tests of a number of phonograph pickups. Tests are now under way on several of the other components, and results will appear in the BULLETINS from

time to time. We hope before long to be able to recommend at least one each of all the elements essential to a complete home-assembled unit, radio tuner, amplifier, and record player. In the meanwhile, those items which show up well in the tests will find their use by many as replacements to better the performance of existing equipment. The first reports on the results of these tests follow. We should at this point mention that the finding of really good units is most difficult. The situation is not so bad with pickups (although one of the best pickups now available is priced at around $105, with the necessary equalizer, but it is doubtful if there is any good loud-speaker available even in the $100 price class[1], and we know of only one first-class amplifier available to ultimate consumers (the *Brook*, briefly listed later in this article). Good radio tuners are scarce as hens' teeth, and any tuner which appears to be well enough designed to have a chance of giving first-rate performance will be exceedingly expensive ($100 up). (However, the marked low quality of radio programs at this time may make it unnecessary for many to concern themselves with purchasing a tuner for the present.)

Radio or Phonograph Loud-Speaker

B. Intermediate

Altec Lansing, Model 603 (Altec Lansing Corp., 1161 N. Vine St., Hollywood 38) Price, about $70. Although many would regard this as a very high-priced speaker, it is *in today's market* one of the moderately priced speakers for use of ultimate consumers who want exceptional reproduction of music. (*Altec's* regular [604] dual speaker is priced at about $210; this make is very well known by people who do not seek to save expense in setting up record-player units for home and sound-studio use.) Permanent-magnet type, with 15-3/16 in. overall diameter cone (about 14 in. effective cone diameter). Unit had 3-in. domed aluminum diaphragm and small "multicell" horn mounted on speaker axis for reproduction and distribution of tones above about 2000 cycles. Large cone (for low register) said to be made of molded paper. Frequency response (approximately 50 to 7000 cycles) not considered adequate for wide-range reproduction (as of FM radio broadcasts, for example), but this frequency range would be wide enough for present-day phonograph records, except transcription disks and possibly the special new English *Decca FFRR* Records. However, the speaker had considerable distortion in range from 3400 to 3500 cycles. This distortion was found to be quite noticeable on reproduction of symphonies, etc. Considered not as good as a *Jensen* dual speaker priced 25% cheaper. **3**

Audio Amplifiers

A fuller report on the following amplifier will appear in a future BULLETIN, but we hasten to introduce this brief listing for the benefit of those who may be in a hurry to equip with a high-fidelity amplifier, and can afford to pay the very considerable price of the *Brook*.

A. Recommended

Brook High Quality Audio Amplifier, Model 10C2, Serial No. 1043 (Lincoln Walsh design) (Brook Electronics, Inc., Box 430, Elizabeth, N.J.) Net price, about $225. 17 in. long, 12 in. deep, and 9½ in. high. 11 tubes. Basic amplifier with a shock-mounted preamplifier and volume control, bass control, treble control, pilot light, and on-off switch. Gain, 80 db.; tonal range 25 to 20,000 cycles (*within 1 db.*). Power output, 31.4 watts at 400 cycles; 19 watts at 25 cycles (5% distortion, in both cases). (Output very high and distortion very low, compared with other available amplifiers.) **AA3**

The following amplifier was tested in the hope that it would prove to be satisfactory for phonograph use. If so, it would have been a desirable purchase because of its moderate price.

During the test of this unit a filter condenser failed and thus not all of the data which were to have been taken were measured. The information, however, suffices for the purpose of rating the amplifier. (The failure of the part during test was not given any special weight in the rating, such casualties are likely to occur with almost any of the new equipment on today's market.)

C. Not Recommended

Thordarson, Model T-30W08A (Thordarson Electric Mfg. Div., Maguire Industries, Inc., 500 W. Huron St., Chicago 10) Net price about $30. 4 tubes. Had tone control (treble attenuator type), and input circuits for both phonograph pickup and microphone. Output stage consisted of single 6L6 tube with desirable inverse feedback circuit. "Gain" controls were provided for both phonograph and microphone circuits. Frequency response, 25 to 20,000 cycles (ample) but bass reproduction poor in that power output was insufficient below 100 cycles, where adequate power is necessary. No bass "boost" or means of increasing bass response provided—this would have been desirable for phonograph reproduction, since records are necessarily "undercut" in the bass region. Power output (with less than 5% distortion) about 7 watts at 100 cycles and above—not considered adequate for high-fidelity reproduction. Below 100 cycles, power output fell off rapidly. On listening test, quality of reproduction considered only fair. Hum level desirably low. Quality of parts about

[1]For the listener who wants good but not superlative reproduction, it is probable that sufficiently good record reproduction will be provided for by the use of a single-unit speaker of good quality, such as was sold before the war at about $15. It must be remembered that in any case, high-priced equipment alone does not provide fine quality, for it must be in proper adjustment and maintained so, and the speaker housing, room acoustics, etc., are quite important factors. In cases where very exceptional reproduction is required, the whole problem of the room and its furnishings, as well as the reproducing equipment, must be considered carefully, and no one but a *very exceptional* "sound man" would be of much use in making and adjusting such an installation.

equivalent to those used in average radio receiver. This amplifier is priced at a figure which is especially low for today's market, and the equipment would, therefore, be worth considering for use with a microphone and in "public address" work, or where high fidelity is not essential and the low power output will suffice, which will be true for many purposes. We believe that for such use the amplifier would warrant a rating of *B. Intermediate.* **1**

Phonograph Pickups

A. Recommended

Pickering, Model 161M (Pickering & Co., Inc., 29 West 57 St., New York 19) Pickup alone, $84; 1 tube, 1-position equalizer and preamplifier (all that is required for shellac records), $19.50; 4 tube, 5-position equalizer and preamplifier, $96. For 10, 12, and 16 inch records. Radius of needle tip in the pickup tested was .0025—the correct radius for a needle that must be able to play either shellac or transcription records. (.003 is the correct needle tip radius when the pickup is to be used for shellac records only, which will apply to a preponderant majority of users at the present time.) Response curve of pickup when equalized, closer to the ideal than that of any pickup so far reported. (Gave superior performance also, when tested without equalization—a considerable advantage, as fully satisfactory equalization is possible only for a pickup with a smooth and preferably flat curve, free from pronounced humps or valleys.) The 5-position preamplifier and equalizer was found capable of proper adjustment for transcriptions and poor quality commercial recordings requiring removal of considerable "high frequency noise." Output from pickup, 0.0085 volts; from preamplifier and equalizer, 0.220 volts (may not be sufficient in all cases; in practice this must be determined by trial where there is doubt as to adequacy of amplification available in set or an audio amplifier of low gain). Harmonic distortion, very low (of the order of 0.5%). Needle pressure 0.8 oz. Tracking error maximum, 4.8° (fairly low, but not the lowest of the pickups so far reported). **AA3**

Note: This is a preliminary report. Fuller details will appear in a later BULLETIN.

* * *

A short time before the completion of the test of phonograph pickups reported in the November 1946 BULLETIN, it was learned that the *Astatic*, Model FP-38, pickup was to be superseded by a new model. A cartridge for the new type was therefore obtained and reported on in the January 1947 issue. The present report covers a complete unit (arm and new cartridge).

B. Intermediate

Astatic, Model 508 (Astatic Corp., Conneaut, Ohio) $9.66. Crystal type. Frequency response (unequalized) good, but with small peak at 6000 cycles and a rising characteristic in the lower middle register. (Curve not so smooth as that of the *Model FP-38*—reported in November 1946 Bulletin—which this unit supersedes). As no instructions for use of an equalizer were furnished with this unit, test was made of the output without equalization. Distortion low (maximum of 2% second harmonic) except at 6000 cycles where distortion rose to 8%. This increase in distortion was caused by the resonant peak mentioned above, the purpose of which was evidently to increase the frequency range, but somewhat at the expense of clean reproduction (although the second harmonic of 6000 cycle and higher tones would be practically inaudible, perhaps, for older people). Intermodulation effects make such resonance undesirable. Only a negligible amount of the third and higher harmonics was present. Needle pressure 1.6 oz., somewhat higher than average for units tested to date. Voltage output, 1.5 volts, adequate for most phonograph amplifiers. Noise output (needle hiss in loud-speaker), low. Direct needle noise noticeable, due to arm resonance at higher frequencies. Tracking error unduly large—17 degrees when mounted in accordance with maker's instructions; this could be reduced somewhat by better location of arm in relation to turntable. Quality of construction good except for method of balancing arm. The spring arrangement used caused considerable friction in the bearings providing for vertical motion. Pickup used replaceable steel needle (desirable). **2**

Off the Editor's Chest

(*Continued from page 2*)

with which to make it; and adequate, effective, heating equipment and fuel. This list covers the classic essentials, with the exception of housing which does not lend itself readily to mass production for a variety of reasons, one of which is the pronounced and very American desire of home owners and prospective home owners for dwellings that conform to their own particular needs or tastes. Omitted also—in the interest of simplification—are a wide variety of items that in this country are considered necessities.

Mass production has in the past been extremely effective in making the American standard of living the highest in the world, by turning out an almost infinite variety of commodities at a rate that has permitted, if not required, their being sold at prices so low that a larger number of consumers with average incomes have been able to purchase them than anywhere else in the world. The essential factor in the successful functioning of mass production is continuity of operation. When an automobile assembly line, for example, is shut down for lack of steel or coal due to strikes in those industries, the overhead costs of watchman, maintenance men, and clerical workers, heat, lighting, insurance, and many other costly

items, required even when the actual output of the factory has stopped, must be charged against cars already made or to be made.

Sometimes scarcity of a needed raw material from another industry will interfere with the production of certain items. Strikes in the copper mines a year ago seriously interfered with production of "fractional horse-power" motors. This in turn prevented the manufacturers of washing machines and refrigerators and a number of other household appliances from finishing their products. In fact, it has been the subject of indignant conversation in some quarters that washing machines and refrigerators had to be shipped to dealers without the necessary motors, in order to get them out of the way, since manufacturers' warehouses were filled to overflowing with the uncompleted appliances which had to be moved into distribution, if factories were not to be shut down completely. At the present time, automobile manufacturers are fearful that layoffs and production cutbacks will be necessary in the industry because of a lack of pig iron. Arbitrarily large amounts of iron have been diverted by government order for use in the housing industry.

These are just a few instances of the types of interruptions in the continuous process of production that make for delay and higher costs, to give some idea of the complexity of manufacturing and distributing operations; consumers see and consider, as a rule, only the finished product in the form of an automobile or washing machine in the dealer's store.

It is obvious that the job of attaching a motor to a washing machine in the shop of a dealer by some serviceman whom the dealer must hire for the purpose will be more difficult and more costly than if the job were done in the factory. The extra cost of inefficient methods imposed on industry by governmental and other distortions of the normal production processes *is bound to be reflected in a higher price of the machine to the consumer.* When such wastes and inefficiencies are multiple and widespread, as they are at this time, the extra costs put many items beyond the reach of low and middle income consumers.

How to put industrial production back on a basis of pre-war efficiency so that the many items which consumers would like to buy can be bought, and bought at prices they can afford is a complex and difficult problem. The painful process of readjustment involved in the response of supply to demand may accomplish some results (at the cost, of course, of some unemployment and reduced income for many workmen, merchants, and others involved), if consumers cannot and will not make substantial purchases at present prices. In addition to the rather drastic step of declining to buy at prices they consider excessive, consumers can help to bring about a resumption of more efficient manufacturing operations by publicly expressing their opposition to current bad practices, in letters to the editors of their local newspapers and to their congressmen and senators. Their objections can be directed, for example, at unreasonable work stoppages, strikes in violation of contracts, government restrictions which help a favored industry or group at the expense of another, all attempts of business, organized labor, and government to maintain the present artificially high price level by subsidies, trade agreements, and restriction of output.

Public anger at the absence of meat in the butcher shops last fall was so effective in producing quick results that if consumers really want to have low-priced appliances and other items generally available again, it would seem that they might very likely make progress in that direction by expressing their views quite clearly and forcefully, in places where their protests will be heard and heeded.

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Ratings of Motion Pictures

THIS section aims to give critical consumers a digest of opinion from a wide range of motion picture reviews, including the motion picture trade press, leading newspapers and magazines—some 19 different periodicals in all. The motion picture ratings which follow thus do not represent the judgment of a single person, but are based on an analysis of critics' reviews.

The sources of the reviews are:

Box Office, Charm, Chicago Daily Tribune, The Christian Century, Cue, Daily News (N.Y.), *The Exhibitor, Harrison's Reports, Motion Picture Herald, National Legion of Decency List, Newsweek, New York Herald Tribune, New York Times, Parents' Magazine, Release of the D.A.R. Preview Committee, Successful Farming, Time, Variety* (weekly), and *Unbiased Opinions of Current Motion Pictures* which includes reviews by the General Federation of Women's Clubs, the American Legion Auxiliary, National Film Music Council, and others.

The figures preceding the title of the picture indicate the number of critics who have been judged to rate the film A (recommended), B (intermediate), and C (not recommended), on its entertainment values.

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

ade—adventure
biog—biography
c—in color (Technicolor, Cinecolor, Trucolor, or Magnacolor)
car—cartoon
com—comedy
cri—crime and capture of criminals
doc—documentary
dr—drama
fan—fantasy
hist—founded on historical incident
mel—melodrama
mus—musical
mys—mystery
nov—dramatization of a novel
rom—romance
soc—social-problem drama
trav—travelogue
war—dealing with the lives of people in wartime
wes—western

A	B	C		
2	2	10	**Abie's Irish Rose**	*com AYC*
—	—	5	**Accomplice**	*cri-mel A*
—	—	7	**Affairs of Geraldine**	*mus-com A*
—	2	4	**Alias Mr. Twilight**	*cri-mel A*
—	3	1	**Angel and the Badman**	*wes AYC*
1	8	8	**Angel on My Shoulder**	*fan A*
—	2	3	**Appassionata**	*mus-dr A*
—	5	—	**Arnelo Affair, The**	*mys-mel A*
—	8	8	**Bachelor's Daughters, The**	*mus-com A*
—	4	5	**Bamboo Blonde, The**	*mus-war-rom A*
—	2	11	**Beast with Five Fingers, The**	*cri-mel A*
—	1	2	**Beauty and the Bandit**	*wes AYC*
—	8	3	**Bedelia**	*cri-dr A*
—	2	1	**Before Him All Rome Trembled**	*war-mus-dr A*
2	3	2	**Beginning or the End, The**	*war-dr AYC*
—	4	4	**Below the Deadline**	*mel A*
9	5	1	**Best Years of Our Lives, The**	*war-dr A*
—	1	6	**Betty Co-ed**	*mus-com A*
1	8	8	**Big Sleep, The**	*cri-mel A*
—	8	7	**Black Angel**	*mus-mel A*
—	2	2	**Blind Spot**	*mys-mel A*
—	1	5	**Blonde for a Day**	*mys A*
—	4	5	**Blondie Knows Best**	*com AYC*
—	2	3	**Blondie's Big Moment**	*com A*
1	15	4	**Blue Skies**	*mus-biog-c A*
—	6	—	**Boomerang**	*cri-mel A*
—	—	5	**Born to Speed**	*mel AYC*
—	1	6	**Boston Blackie and the Law**	*cri-mel AY*
—	2	2	**Boy! What a Girl**	*mus-com AY*
—	4	1	**Brasher Doubloon, The**	*mys-mel A*
—	1	2	**Bridge of Sighs**	*mel A*
4	13	—	**Brief Encounter**	*dr A*
—	3	3	**Bringing Up Father**	*com AY*
—	1	6	**Brute Man, The**	*cri-mel A*
4	11	3	**Caesar and Cleopatra**	*dr-c A*
—	3	2	**Calendar Girl**	*mus-com AY*
1	8	3	**California**	*wes-c A*
1	6	1	**Carmen**	*dr A*
—	5	7	**Chase, The**	*cri-mel A*
—	5	4	**Child of Divorce**	*dr A*
1	7	1	**Children of Paradise**	*dr A*
—	—	4	**Cigarette Girl**	*mus-com A*
—	1	2	**Clandestine**	*war-dr A*
1	13	3	**Cloak and Dagger**	*war-mel A*
—	3	—	**Conquest of Cheyenne**	*wes AYC*
—	2	2	**Cowboy Blues**	*mus-wes AYC*
—	2	7	**Crime Doctor's Manhunt**	*mys-mel A*
—	6	4	**Criminal Court**	*mus-cri-dr A*
—	4	11	**Cross My Heart**	*mus-cri-mel A*
—	4	4	**Dangerous Millions**	*cri-mel AYC*
—	1	5	**Dangerous Money**	*mys-mel AYC*
—	3	6	**Dark Alibi**	*mys-mel AYC*
2	10	3	**Dark Mirror, The**	*mys-mel A*
—	6	6	**Dead Reckoning**	*mel A*
—	2	2	**Death Valley**	*mel-c AYC*
—	9	7	**Deception**	*dr A*
—	3	5	**Decoy**	*mel A*
—	—	4	**Devil on Wheels, The**	*mel AYC*
—	3	2	**Devil's Hand, The**	*fan A*
—	5	1	**Devil's Playground, The**	*wes AYC*
—	4	3	**Dick Tracy versus Cueball**	*mel A*
—	—	3	**Don Ricardo Returns**	*rom-dr A*
—	3	1	**Driftin' River**	*mus-wes AYC*
3	2	1	**Duel in the Sun**	*wes-c A*
—	8	3	**Earl Carroll Sketchbook**	*mus-com A*
—	1	10	**Easy Come, Easy Go**	*com A*
—	3	—	**Extenuating Circumstances**	*cri-com A*
—	4	2	**Fabulous Suzanne, The**	*com A*
—	2	7	**Falcon's Adventure, The**	*cri-mel AYC*
1	2	—	**Farmer's Daughter, The**	*com A*
—	1	2	**Fighting Frontiersman, The**	*wes AYC*
1	4	1	**Fool's Gold**	*wes AYC*
—	1	2	**Frenzy**	*mys-mel A*
—	7	2	**G.I. War Brides**	*dr A*
1	6	6	**Gallant Bess**	*war-dr-c AYC*
—	4	12	**Gallant Journey**	*dr A*
—	2	3	**Gas House Kids**	*mel AYC*
—	2	1	**Genius and the Nightingale, The**	*dr A*
—	—	7	**Genius at Work**	*mys-com A*
—	6	2	**Gentleman Joe Palooka**	*com A*
—	1	2	**Ginger**	*dr AYC*
—	2	1	**Gunman's Code**	*wes AYC*
—	1	4	**Heading West**	*wes AYC*
—	3	2	**Heldorado**	*mus-wes AYC*
—	1	2	**Her First Affair**	*dr A*
—	6	7	**Her Sister's Secret**	*war-dr A*
—	2	5	**High School Hero**	*mus-com AY*
—	7	—	**Home in Oklahoma**	*mus-wes AYC*
1	8	8	**Humoresque**	*mus-dr A*
—	3	1	**I Know Where I'm Going**	*dr A*
—	3	1	**I Live as I Please**	*mus-dr AYC*
—	4	8	**If I'm Lucky**	*mus-com A*
—	6	5	**I'll Be Yours**	*mus-com A*
—	—	6	**Inner Circle, The**	*cri-mel A*
—	—	6	**Invisible Informer**	*cri-mel A*
—	5	—	**It Happened on Fifth Avenue**	*mus-dr A*
—	3	3	**It's a Joke, Son!**	*com A*
6	7	1	**It's a Wonderful Life**	*dr AY*
—	2	7	**It's Great to be Young**	*mus-com AY*
2	5	6	**I've Always Loved You**	*mus-dr-c A*

A	B	C		
2	5	—	**Jericho**	*war-dr A*
1	6	3	**Johnny Frenchman**	*war-dr A*
—	6	1	**Johnny O'Clock**	*mys-mel A*
5	9	1	**Jolson Story, The**	*mus-biog-c AY*
2	13	1	**Killers, The**	*cri-mel A*
—	2	7	**Ladies' Man**	*com A*
—	1	3	**Lady Chaser**	*mel AY*
1	13	1	**Lady in the Lake**	*cri-mel A*
—	4	—	**Lady Surrenders, A**	*rom A*
—	2	3	**Landrush**	*mus-wes AYC*
—	2	6	**Last Crooked Mile, The**	*cri-mel A*
1	5	—	**Late George Apley, The**	*nov A*
—	2	2	**Lawless Breed**	*mus-wes AYC*
—	1	2	**Lighthouse**	*dr A*
—	2	5	**Little Iodine**	*com A*
—	4	3	**Little Miss Big**	*dr AYC*
—	5	2	**Locket, The**	*mel A*
—	1	2	**Lone Star Moonlight**	*mus-wes A*
—	1	4	**Lone Wolf in Mexico, The**	*mys-mel A*
—	7	4	**Love Laughs at Andy Hardy**	*mus-com AY*
—	2	2	**Macomber Affair, The**	*dr A*
—	2	1	**Magic Bow, The**	*mus-nov AYC*
1	10	5	**Magnificent Doll, The**	*hist-dr A*
—	1	2	**Magnificent Rogue, The**	*com A*
—	1	5	**Man from Morocco, The**	*mel A*
—	6	7	**Man I Love, The**	*mus-mel A*
—	5	4	**Man's Hope**	*war-dr A*
3	11	2	**Margie**	*com-c AY*
—	3	3	**Michigan Kid**	*wes-c AYC*
—	7	1	**Mighty McGurk, The**	*dr AYC*
—	—	3	**Millie's Daughter**	*dr A*
—	—	4	**Missing Lady, The**	*mys-mel A*
—	5	12	**Mr. Ace**	*dr A*
—	3	2	**Mr. District Attorney**	*cri-mel A*
—	4	1	**Mr. Hex**	*mel AYC*
—	6	1	**Murder in Reverse**	*cri-mel A*
—	5	2	**My Brother Talks to Horses**	*com AYC*
2	13	1	**My Darling Clementine**	*wes AYC*
1	2	—	**My Favorite Brunette**	*com AY*
—	3	—	**Navajo Trail, The***	*wes AYC*
—	6	7	**Never Say Goodbye**	*com A*
—	8	7	**No Leave, No Love**	*mus-com AY*
—	5	8	**Nobody Lives Forever**	*cri-mel A*
1	4	11	**Nocturne**	*mus-mel AY*
—	3	9	**Nora Prentiss**	*dr A*
2	11	4	**Notorious Gentleman**	*war-dr A*
—	4	2	**Out California Way**	*mus-wes-c AYC*
—	—	3	**Outlaw of the Plains**	*wes AYC*
—	1	4	**Overland Riders**	*wes AYC*
1	8	2	**Overlanders, The**	*dr AYC*
—	3	2	**Paris Frills**	*dr A*
—	6	7	**Perfect Marriage, The**	*com A*
—	3	5	**Personality Kid**	*com AYC*
—	—	5	**Phantom Thief, The**	*cri-mel A*
—	3	3	**Pilgrim Lady, The**	*com A*
—	7	3	**Plainsman and the Lady, The**	*wes AY*
—	3	4	**Postmaster's Daughter, The**	*nov A*
—	—	5	**Prairie Badmen**	*mus-wes AYC*
—	3	—	**Pursued**	*wes A*
1	1	2	**Queen for a Night**	*mus-rom A*
2	4	—	**Raider, The**	*war-doc AY*
—	1	2	**Raiders of the South**	*mus-wes AYC*
1	11	5	**Razor's Edge, The**	*dr A*
—	5	1	**Red House, The**	*cri-dr A*
—	9	2	**Rendezvous with Annie**	*war-com A*
—	2	1	**Renegade Girl**	*mel A*
—	6	5	**Return of Monte Cristo**	*mel A*
—	6	1	**Roll On Texas Moon**	*mus-wes AYC*
—	2	1	**Rolling Home**	*dr AYC*
—	4	1	**Rustler's Roundup**	*wes AYC*
—	5	9	**San Quentin**	*mel A*
—	5	11	**Scandal in Paris, A**	*cri-mel A*
—	3	2	**Sea of Grass**	*wes-dr A*
1	8	5	**Secret Heart, The**	*mus-mel AY*
—	1	6	**Secret of the Whistler**	*mys A*

* An error was made in the totals of this listing last month.

A	B	C		
—	1	4	**Secrets of a Sorority Girl**	*cri-dr A*
—	1	2	**Seven Were Saved**	*war-mel A*
—	5	5	**Shadow of a Woman**	*cri-mys A*
—	2	5	**Shadowed**	*mys-mel A*
—	—	3	**Shadows on the Range**	*wes AYC*
—	1	4	**Shadows over Chinatown**	*mys-mel AYC*
—	7	4	**Shocking Miss Pilgrim, The**	*mus-com-c AY*
—	9	2	**Show-Off, The**	*com AYC*
—	1	3	**Silver Range**	*wes AYC*
—	10	3	**Sinbad the Sailor**	*adv-c AYC*
—	—	7	**Sing While You Dance**	*mus-com AYC*
—	1	6	**Singin' in the Corn**	*mus-com AYC*
—	2	2	**Singing on the Trail**	*mus-wes AYC*
1	6	—	**Sioux City Sue**	*mus-wes AYC*
—	4	3	**Sirocco**	*dr A*
—	2	6	**Slightly Scandalous**	*mus-com AY*
1	4	—	**Smash Up—The Story of a Woman**	*mus-dr A*
—	5	5	**So Dark the Night**	*mel A*
1	2	5	**Song of Sheherazade**	*mus-dr-c AY*
—	—	3	**Song of the Sierras**	*mus-wes AYC*
1	10	3	**Song of the South**	*car-c AYC*
—	1	3	**South of Monterey**	*mus-wes AYC*
—	2	1	**South of the Chisholm Trail**	*wes AYC*
—	1	5	**Spook Busters**	*com AY*
—	2	3	**Stage Coach to Denver**	*wes AYC*
3	10	—	**Stairway to Heaven**	*fan-c A*
—	1	3	**Stars Over Texas**	*mus-wes AYC*
—	11	5	**Stolen Life, A**	*dr A*
—	5	3	**Stone Flower**	*fan-c AYC*
—	4	—	**Story of the Pope, The**	*doc AYC*
—	1	5	**Strange Holiday**	*mel A*
—	—	7	**Strange Journey**	*mel A*
1	4	8	**Strange Woman, The**	*dr A*
—	4	1	**Suddenly It's Spring**	*com A*
—	2	4	**Susie Steps Out**	*mus-com A*
—	4	2	**Sweetheart of Sigma Chi**	*mus-com A*
1	6	9	**Swell Guy**	*dr A*
—	2	4	**Taras Family, The**	*war-dr A*
—	4	13	**Temptation**	*cri-mel A*
—	2	1	**Terror Trail**	*wes AYC*
—	3	7	**That Brennan Girl**	*mel A*
—	2	5	**That Way With Women**	*com AY*
—	—	—	**Thieves' Holiday (See Scandal in Paris, A)**	
1	11	3	**13 Rue Madeleine**	*war-mel AYC*
—	1	2	**Thirteenth Hour, The**	*cri-mel AY*
—	14	1	**Three Little Girls in Blue**	*mus-com-c AY*
—	8	7	**Thrill of Brazil, The**	*mus-com A*
4	11	3	**Till the Clouds Roll By**	*mus-biog-c AY*
—	8	7	**Time, the Place, and the Girl, The**	*mus-com-c A*
1	8	1	**Time of Their Lives, The**	*com AYC*
—	1	6	**Traffic in Crime**	*mel A*
—	2	2	**Trail to San Antone**	*mus-wes AYC*
—	—	5	**Trap, The**	*mys-mel A*
—	—	5	**Tumbleweed Trail**	*mus-wes AYC*
—	4	2	**Turning Point, The**	*war-dr A*
1	10	4	**Two Years Before the Mast**	*adv AYC*
—	4	1	**Under Nevada Skies**	*mus-wes AYC*
2	8	6	**Undercurrent**	*mel A*
—	3	3	**Unexpected Guest**	*wes AY*
—	3	7	**Vacation in Reno**	*com A*
—	1	10	**Valley of the Zombies**	*cri-mel A*
—	12	4	**Verdict, The**	*cri-mel A*
—	2	1	**Vigilantes of Boomtown**	*wes AYC*
—	1	10	**Wake Up and Dream**	*mus-fan-c AYC*
—	7	7	**Wanted for Murder**	*cri-mel A*
3	6	1	**Welldigger's Daughter, The**	*dr A*
—	—	5	**West of the Alamo**	*mus-wes AYC*
—	6	7	**White Tie and Tails**	*com A*
—	7	11	**Wicked Lady, The**	*dr A*
—	—	7	**Wife Wanted**	*cri-mel A*
—	3	7	**Wild Beauty**	*dr AYC*
—	—	4	**Wild Country**	*mus-wes AYC*
—	3	1	**Wild West**	*mus-wes-c AYC*
7	8	—	**Yearling, The**	*dr-c AYC*
—	5	1	**Years Between, The**	*nov A*
—	—	3	**Youth Aflame**	*dr A*

The Consumers' Observation Post

(Continued from page 4)

ERSATZ FOOD PRODUCTS AND PRACTICES developed during the period of wartime shortages wrought changes in familiar foods. First the fat shortage has brought about the use of "extenders" or emulsifiers in commercial baked goods. According to one estimate, such products enable one pound of shortening to do the work of as many as three in some bakery goods. Just what effect these "extenders" have on the human digestive tract is of course not known, but so long as fats are scarce and high in price the emulsifiers will undoubtedly be used. The attempt to put higher amounts of wheat bran in bread by the enforced use of 80 percent extraction flour was fortunately short-lived, so that probably no great amount of injury was done to consumers. It was recognized, however, at the time that animals can digest bran more conveniently and assimilate more food value from relatively indigestible roughages than can human beings, and that accordingly there must be doubt about the wisdom of transferring the assimilation problem of hard-to-digest foods from domestic animals to man. In recently reported experiments at the Wellcome Research Laboratories it was shown that even white mice did better on white bread than on whole-wheat bread in certain respects. Tests were made to determine the susceptibility of the laboratory animals to pneumococcal infection, and it was found that the resistance of the mice maintained on white bread for six days before the injection of the pneumococci was better than that of the mice fed whole-wheat bread.

* * *

SOAP AND SOAP POWDERS, now that price controls have been lifted, are fairly plentiful on grocers' shelves. It appears that soap can be made so rapidly today that practically the moment controls went off and prices went up the soap industry went into high gear and presto, the shortage was a thing of the past. Economy-minded housewives should be on their guard, however, against rackets like the one reported by Argus Advisory Service (P. O. Box 577, Benj. Franklin Sta., Washington, D. C.). It appears that certain Midwest housewives were advised by mail that by sending in $2 they could obtain 25 cakes of soap and 30 packages of soap powder. What they got for their money was 25 cakes of soap weighing 3/4 oz. each and 30 packages of soap powder weighing 2-3/4 oz. each, or, the Argus Service estimates, about a dollar's worth of soap for two dollars.

Padlocking your pocketbook is one way to save money—

But it's not nearly

so practical as consulting

Consumers' Research Bulletin!

Please tell your friends that they too can become thrifty buyers by making use of CR's practical, unbiased, scientific advice and counsel.

(Convenient Subscription Blank Appears on Next Page.)

PEOPLE WHO DWELL IN SMOKY CITIES will be interested to know that according to Dr. Clarence A. Mills, of the University of Cincinnati, an eminent researcher in public health questions, there exists a direct and highly significant relationship between pollution of the air and infectious diseases of the respiratory tract in man. According to Dr. Mills, this hazard involves principally those who live in the most heavily industrialized city districts, and the situation is probably fully comparable in severity with the enteric disease (disease affecting the intestines) picture that was once so serious and was distinctly altered when purification of city water supplies became the standard practice.

* * *

NEW PRODUCTS: Cellowax Furniture Polish (Cellowax Company, Baltimore) is an oily, white emulsion which upon analysis was found to consist of approximately 6.5% triethanolamine soap, 40.8% light mineral oil, with the remainder (52.7%), water. As pointed out in previously issued Bulletins, water is an ingredient commonly present in furniture polishes, but is wholly undesirable in such use, since the presence of large amounts of water may cause warping of the panels if the water is allowed to enter the interspaces between panel edges of furniture.

Ethyl Cleaner (Ethyl Corporation, Chrysler Bldg., New York 17), 35 cents for a 6-oz. bottle, a widely advertised product for cleansing various things about the home, and asserted to be "Better, faster, milder than soap," has recently been analyzed and found to consist of a surface active agent (synthetic soap) of the sodium alkyl-benzene sulfonate type, probably Nacconol NRSF. There is about 16.7% of this material. There are also present about 4% urea (used for increasing the solubility of the surface active agent) and 0.1% sodium hexametaphosphate, a water softener and detergent that is not alkaline in character. The impression is given that Ethyl Cleaner is suitable for all sorts of cleaning ("Can be used wherever water is used for cleaning."), and pots and pans are mentioned in the advertising. Yet it is evidently not intended for dishes (which are not mentioned on the label), as it has a somewhat unpleasant odor which people would perhaps not wish to have associated with the cleansing of items to be used on the table. The directions especially recommend it for cleaning floors, linoleum, windows, mirrors, glassware, woodwork, walls, tiles, refrigerators, stoves, mops, colorfast upholstery, and rugs; also for automobiles.

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PHONOGRAPH RECORDS

By Walter F. Grueninger

Please Note: Prices quoted do not include taxes. In the ratings AA indicates highly recommended; A, recommended; B, intermediate; C, not recommended.

ORCHESTRA

Beethoven: *Symphony No. 4.* London Philharmonic Orchestra under Beecham. 8 sides, Victor Set 1081. $4.85. One of the least often performed Beethoven symphonies. The cream of the competition, Toscanini—BBC Symphony Victor Set 676, offers a more intense performance and less effective recording. Though Beecham's new Victor set is deficient in high frequencies, by current standards, overall it is my choice.
Interpretation AA
Fidelity of Recording B

Beethoven: *Symphony No. 6* ("Pastoral"). Philadelphia Orchestra under Walter. 10 sides, Columbia Set 631. $5.85. A great symphony. Walter's relaxed performance is admirable and he is well recorded with the exception of insufficient dynamic contrast, particularly in "The Storm." On the other hand, Toscanini's reading in Victor Set 417 (best of the competition) is so extraordinary and his recording, though lacking the highs of Walter, is so satisfactory otherwise, that I prefer it. Walter's surfaces are not as quiet as Toscanini's, which come from a pre-war year.
Interpretation AA
Fidelity of Recording A

Brahms: *Symphony No. 2.* San Francisco Symphony Orchestra under Monteux. 8 sides, Victor Set 1065. $4.85. An important work opulently recorded but in performance, curiously labored. The first movement, worst in this respect, is played in 14 minutes against the 12 minutes of Weingartner's Columbia Set 493. However, Victor's engineers triumph in fidelity and in planning: despite Victor's playing time of 36 minutes against Columbia's 33, Victor records on 8 sides (Columbia on 10) saving the consumer a dollar. But the performances on Columbia Sets 493 and 265 (Beecham) are preferable.
Interpretation B
Fidelity of Recording AA

Copland: *A Lincoln Portrait.* Boston Symphony Orchestra under Koussevitzky with Melvyn Douglas (speaker) (3 sides) & **Lincoln:** *Gettysburg Address.* Melvyn Douglas (speaker) (1 side). Victor Set 1088. $2.85. The major work still does not appeal to me. Orchestra performs superbly but Douglas' militant declamation leaves me cold. Does not replace Columbia X266.
Interpretation B
Fidelity of Recording AA

Mozart: *Minuets* (K176). Vox Chamber Orchestra under Fendler. 6 sides, Vox Set 166. $3.75. First recording of these minuets, composed for a Salzburg Christmas party in 1773, when Mozart was 18. Skillfully played but the recording lacks "bite." Quiet surfaces.
Interpretation AA
Fidelity of Recording B

Mozart: *Symphony No. 38* ("Prague"). St. Louis Symphony Orchestra under Golschmann. 6 sides, Victor Set 1085. $3.85. A masterwork. The subtlety evident in Beecham's Columbia Set 509, which I consider the best performance of this symphony, is missing in Golschmann but he has sufficient warmth and movement and is better, though not brilliantly, recorded.
Interpretation A
Fidelity of Recording A

Prokofieff: *Symphony No. 5.* Philharmonic-Symphony Orchestra of New York under Rodzinski. 10 sides, Columbia Set 661. $5.85. Complex melodies and harmonies make it advisable to hear this work repeatedly before reaching a sound judgment of its value, though most critics believe it is a good symphony. Performance—powerful and spirited. Recording—lacks depth; satisfactory volume and frequency range. Inside grooves of side 8 waver in pitch.
Interpretation AA
Fidelity of Recording A

Strauss: *Tod und Verklärung.* Philadelphia Orchestra under Ormandy. 6 sides, Columbia Set 613. $3.85. Understatement of a lurid tone poem. Less elegantly recorded than the best of the competition, Stokowski's Victor Set 217.
Interpretation B
Fidelity of Recording A

Stravinsky: *Firebird Suite* (7 sides) & *Fireworks* (1 side). Philharmonic-Symphony Orchestra of New York under the composer. Columbia Set 653. $4.85. An outstanding Stravinsky work dating from 1910, presented in a new, augmented version. When the music coincides, the composer generally takes a faster tempo than Stokowski in his recorded performances, best of which is 4-year-old Victor Set 933 ($3.85). Although more detail is pointed up in Stravinsky's set, overall it is less fussy than Stokowski's. Columbia's recording lacks the sheen of Victor's.
Interpretation AA
Fidelity of Recording A

Alfred Newman Conducts. Hollywood Symphony under Newman. 6 sides, Majestic Set 201. $3.95. Although I prefer opera arias sung rather than played by a symphony orchestra, these are expressively performed and expertly recorded. For best results, however, on high fidelity machines, attenuate the high frequencies.
Interpretation AA
Fidelity on Recording AA

CONCERTO

Brahms: *Concerto No. 1.* Serkin (piano) and the Pittsburgh Symphony Orchestra under Reiner. 12 sides, Columbia Set 652. $6.85. A ponderous work masterfully played. The sound is less wonderful than we get from English Decca nowadays. Surfaces, at times, are audible. Competitive Victor Set 677 (Schnabel) is not rendered obsolete, though its recording is thinner.
Interpretation AA
Fidelity of Recording A

Dvorak: *Concerto in B Minor.* Piatigorsky (cello) and the Philadelphia Orchestra under Ormandy. 10 sides, Columbia Set 658. $5.85. A standard work played by the greatest cellist in America, recorded with wide range and with depth. Casals, greatest cellist in the world, in Victor Set 458 brings even more warmth to his playing but suffers from older recording technique.
Interpretation AA
Fidelity of Recording AA

Khatchaturian: *Concerto.* Kapell (piano) and the Boston Symphony Orchestra under Koussevitzky. 8 sides, Victor Set 1084. $4.85. First domestic recording of this popular modern work. The performance is more electrifying than Lympany's in the imported Decca Set EDA3 ($9) but the Victor recording is harsher, narrower ranged in frequencies and in dynamics.
Interpretation AA
Fidelity of Recording A

PIANO

Beethoven: *Sonata No. 8* ("Pathetique"). Serkin (piano). 6 sides, Columbia Set 648. $3.85. Early Beethoven sonata. Thin recording, noisy surfaces. Short measure on 5 sides.
Interpretation A
Fidelity of Recording B

Beethoven: *Sonata No. 14* ("Moonlight") (3 sides) & *Sonata No. 17—Allegretto* only (1 side). Levant (piano). Columbia Set X273. $2.85. The need still exists for a new recording of this fine, popular work. Recordings by Bachaus on Victor 8735/6 are best, if you cannot wait. . . .and if you can find them.
Interpretation B
Fidelity of Recording B

Get the book that tells you why.

● Would you rather have roast beef than a vegetable plate for lunch?

● Do you ever have a secret yearning to order steak for breakfast?

● Do you prefer pork chops to vitamin pills?

● Do you find unsatisfying the various "meat substitutes" such as baked beans, peas, vegetable chowders, or soy bean and nut concoctions that are supposed by many to be "better for you" than meat?

Your instincts are sound. There is no basis for the superstition that too much meat is "bad for you." Careful examination of the scientific and technical literature as well as the history of the eating habits of our people from early times all point to one fact: *This country grew up on meat—lots of it.*

The book debunks many superstitions that have grown up around meat, particularly the one fostered by Sylvester Graham, father of whole-wheat bread. It summarizes in non-technical language the many studies made which show how a diet high in meat is an effective bulwark against numerous infections and diseases. It sets forth the interesting theory that the boundless energies of the American people, their unmatched ability to get things done in the face of great obstacles, are in part due to the stamina and drive derived from their earlier habit of eating meat three times a day.

Meat Three Times A Day

by

F. J. Schlink and M. C. Phillips

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